



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

Stanford University Libraries

3 6105 117 799 200







UNITED STATES NAVAL INSTITUTE PROCEEDINGS

*For the advancement of professional, literary and
scientific knowledge in the Navy*

July, 1949

Edited by CAPTAIN W. G. COOPER, U. S. NAVY

Managing Editor—COMMANDER ROY DE S. HORN, U. S. NAVY (RET.)

Associate Editors

CAPTAIN JOSEPH M. P. WRIGHT, U. S. NAVY

COMMANDER C. P. LEMIEUX, U. S. NAVAL RESERVE (INACTIVE)

LIEUTENANT COMMANDER H. O. WERNER,
U. S. NAVAL RESERVE (INACTIVE)



United States Naval Institute

Publication Office: Menasha, Wisconsin

Editorial and Business Office: Annapolis, Maryland

Advertising Department: 2000 Connecticut Ave. N.W., Washington, D.C.

Copyright, 1949, by U. S. Naval Institute

Officers of the Institute

PresidentADMIRAL LOUIS E. DENFELD, U. S. NAVY
Vice-PresidentREAR ADMIRAL JAMES L. HOLLOWAY, JR., U. S. NAVY
Secretary-TreasurerCAPTAIN W. G. COOPER, U. S. NAVY

Board of Control

ADMIRAL LOUIS E. DENFELD, U. S. NAVY (ex officio)
REAR ADMIRAL JAMES L. HOLLOWAY, JR., U. S. NAVY (ex officio)
REAR ADMIRAL W. N. THOMAS (Ch.C.), U. S. NAVY
REAR ADMIRAL ELLIS REED-HILL, U. S. COAST GUARD
REAR ADMIRAL JOHN W. ROPER, U. S. NAVY
CAPTAIN M. A. SAWYER, U. S. NAVY
CAPTAIN ROBERT B. PIRIE, U. S. NAVY
MAJOR JOHN E. WILLIAMS, U. S. MARINE CORPS
CAPTAIN W. G. COOPER, U. S. NAVY (ex officio)

Past Presidents

ADMIRAL DAVID D. PORTER, U. S. NAVY, 1873
REAR ADMIRAL JOHN L. WORDEN, U. S. NAVY, 1874
REAR ADMIRAL C. R. P. RODGERS, U. S. NAVY, 1875-78
COMMODORE FOXHALL A. PARKER, U. S. NAVY, 1878-79
REAR ADMIRAL JOHN RODGERS, U. S. NAVY, 1879-82
REAR ADMIRAL C. R. P. RODGERS, U. S. NAVY, 1882-83
REAR ADMIRAL THORNTON A. JENKINS, U. S. NAVY, 1883-85
REAR ADMIRAL EDWARD SIMPSON, U. S. NAVY, 1885-87
REAR ADMIRAL STEPHEN B. LUCE, U. S. NAVY, 1887-98
REAR ADMIRAL WM. T. SAMPSON, U. S. NAVY, 1898-1902
REAR ADMIRAL H. C. TAYLOR, U. S. NAVY, 1902-1904
REAR ADMIRAL C. F. GOODRICH, U. S. NAVY, 1904-1909
REAR ADMIRAL RICHARD WAINWRIGHT, U. S. NAVY, 1909-11
REAR ADMIRAL BRADLEY A. FISKE, U. S. NAVY, 1911-23
VICE ADMIRAL WILLIAM L. RODGERS, U. S. NAVY, 1923-24
ADMIRAL HENRY B. WILSON, U. S. NAVY, 1924-26
ADMIRAL HILARY P. JONES, U. S. NAVY, 1926-28
REAR ADMIRAL EDWARD W. EBERLE, U. S. NAVY, 1928-29
ADMIRAL S. S. ROBISON, U. S. NAVY, 1929-31
REAR ADMIRAL M. L. BRISTOL, U. S. NAVY, 1931-33
ADMIRAL WILLIAM H. STANDLEY, U. S. NAVY, 1933-35
ADMIRAL DAVID FOOTE SELLERS, U. S. NAVY, 1935-37
FLEET ADMIRAL WILLIAM D. LEAHY, U. S. NAVY, 1937-40
ADMIRAL H. R. STARK, U. S. NAVY, 1940-42
FLEET ADMIRAL CHESTER W. NIMITZ, U. S. NAVY, 1942-43
FLEET ADMIRAL E. J. KING, U. S. NAVY, 1943-46
FLEET ADMIRAL CHESTER W. NIMITZ, U. S. NAVY, 1946-48

For the Advancement of Professional, Literary, and Scientific Knowledge in the Navy

"MURDERER'S ROW—PART OF THE FAMOUS U. S. NAVY FAST CARRIERS AT
ULITHI ANCHORAGE IN THE PACIFIC WAR..... *Front cover*
Official U. S. Navy Photograph

UNITED STATES DISASTER IN CHINA..... 739
By Captain E. M. Eller, U. S. Navy

DIRIGIBLES FOR HEMISPHERE DEFENSE..... 753
By Lieutenant J. Gordon Vaeth, U. S. Naval Reserve (Inactive)

STALIN AND HITLER. PART II. THE ROAD TO STALINGRAD..... 759
By Vice Admiral Kurt Assmann of the former German Navy.
Translated by Captain Roland E. Krause, U. S. Navy

SEE YOUR NAVY LAWYER FIRST..... 774
By Lieutenant Commander Burdick H. Brittin, U. S. Navy

NAVY TRANSPORTATION LOGISTICS..... 777
By Captain F. Clifton Toal (SC), U. S. Naval Reserve (Inactive)

MARINE CORPS TRAINING..... 787
By Major John L. Zimmerman, U. S. Marine Corps Reserve (Inactive)

STATE, WAR, AND NAVY—UNDER ONE ROOF, 1882..... 793
By Dr. Robert Greenhalgh Albion

THE BARBARY CORSAIRS—A LESSON IN APPEASEMENT AND INTERNATIONAL
COOPERATION..... 797
By A. E. Sokol

A METHOD TO EXPEDITE MOORING TO A BUOY..... 804
By Captain W. F. Riggs, Jr., U. S. Navy

SAILING AT THE NAVAL ACADEMY..... 807
By Lieutenant Commander Vining Sherman, U. S. Navy

THE BUREAU OF SHIPS (*Pictorial Section*)..... 813

DISCUSSIONS, COMMENTS, NOTES..... 823

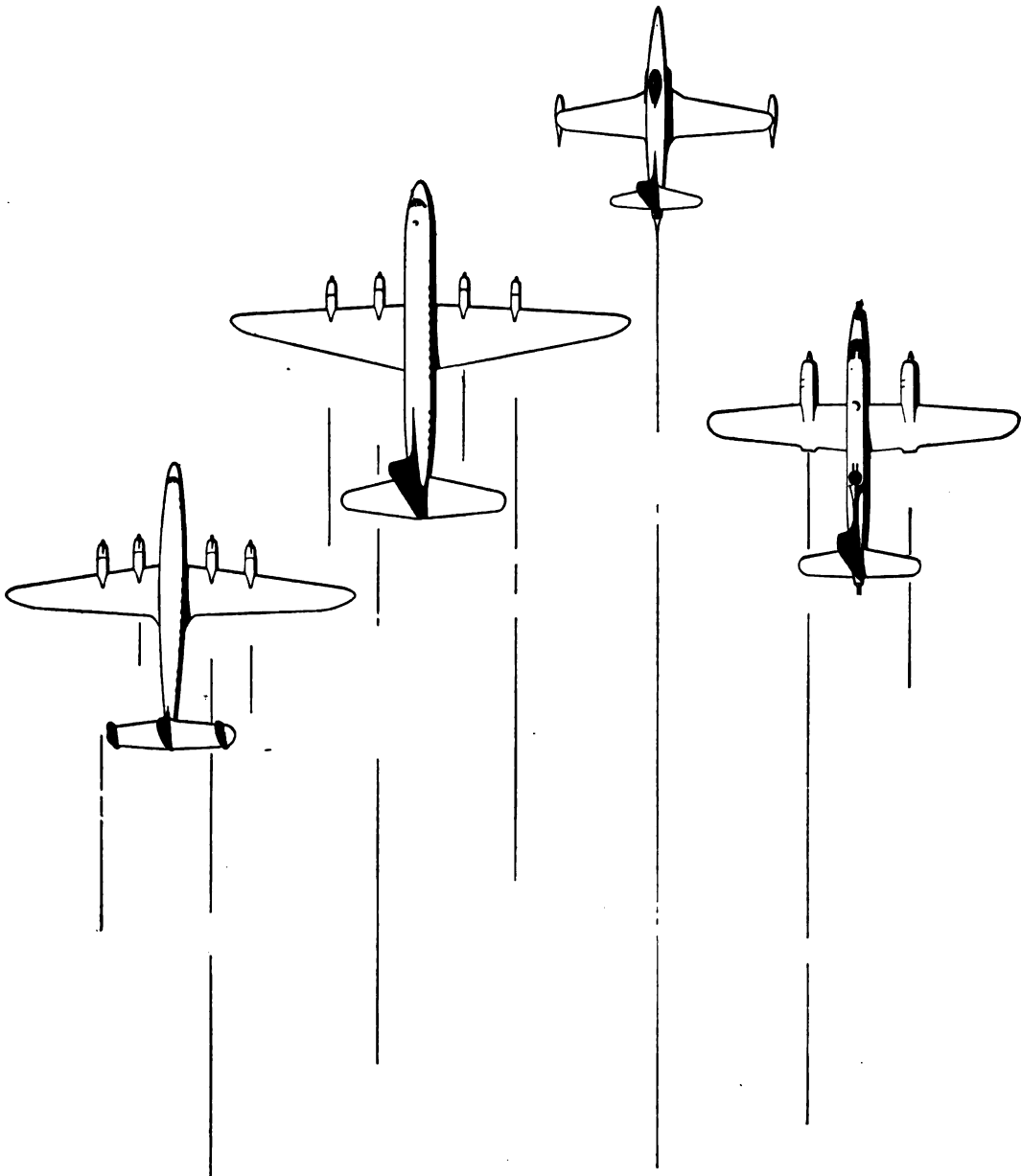
BOOK REVIEWS..... 829

PROFESSIONAL NOTES..... 835

SECRETARY'S NOTES..... 855

The opinions or assertions in the articles are the private ones of the writers, and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

Published monthly at 450 Ahnaip St., Menasha, Wis.
Executive, Editorial and Business Offices, U. S. Naval Institute, Annapolis, Md.
Advertising Department, Suite 710, 2000 Connecticut Ave., N.W., Washington, D.C.
Entered as second-class matter at the post-office at Menasha, Wis., April 4, 1922, and at the post-office at Annapolis, Md., under Act of August 4, 1912. Acceptance for mailing at the special rate of postage provided for in section 1103, Act of October 3, 1919, authorized March 13, 1922.
Membership dues (including PROCEEDINGS), \$2.00 a year.
Subscription rate, \$4.00 a year. (Foreign postage, \$1.00 extra.) Single copies 50 cents.



CURRENT LOCKHEED AIRCRAFT

The Constellation—most widely used high-altitude transport, also known as the U. S. Air Force C-121, flown by the Military Air Transport Service.

The Constitution—the U. S. Navy's largest land-based transport, can carry 180 persons at a cruising speed of 300 mph. Maximum range: 5000 miles.

The F-80—the U. S. Air Force's standard one-place jet fighter—also being produced in a two-place trainer version known as the TF-80C.

The P2V—the U. S. Navy's highly versatile patrol bomber, holding the world's un-refueled long-distance flight record of 11,236 miles.

Lockheed Aircraft Corporation

Burbank, California

Monel sails with the Navy...

to keep hot water CLEAN



All-Monel hot water heating units as installed on U.S.N. ships of various classes. Tanks were fabricated for Crane Co., by The Allcraft Manufacturing Co., Inc., 27 Hayward Street, Cambridge, Mass. Heating coils were made by Taco Heaters, Inc., 137 S. Street, Providence 3, R. I.

For washing their Navy "whites", cooking, or enjoying a shower, crew members on a number of U. S. Navy Destroyer Escorts and Essex Carriers can now be certain of fresh, hot water that runs sparkling pure and clear, with no hint of rust stain or scale.

New Monel* hot water generator units in these vessels mean clean water as well as low maintenance ... for this non-rusting, corrosion-resistant alloy has long proved its reliability in marine service, shore-side steam power plants and domestic water heating service.

In these Navy units, tanks, steam coils, supporting brackets and legs are solid Monel. Tanks range from 14" in diameter (30 gallon) to 26" in diameter (150 gallon). They are fabricated from .109" to .153" sheet Monel. Seams and attachment joints are arc welded with "130X" Monel electrodes.

In your marine applications, where rust, corrosion, and excessive wear can be exceedingly costly, long lasting Monel saves you trouble and saves you money. Next time you order repairs or equipment ... *buy Monel and buy for the future.*

Write to Inco for sources of supply. And remember ... Inco's Technical Service Department is always ready to help solve your metal problems.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall St., New York 5, N. Y.



Monel* "... It's the SEAGOIN'* metal"





Official U. S. Navy Photograph

COUNTRY OF UNLIMITED POSSIBILITIES

Vast in area, vast in population, China's immense resources have scarcely been touched. This road into the interior is one of the few good roads in China. Most transportation is still by water, cart, and coolie-back.

UNITED STATES NAVAL INSTITUTE PROCEEDINGS

Vol. No. 75, No. 7

JULY, 1949

Whole No. 557

UNITED STATES DISASTER IN CHINA

By CAPTAIN E. M. ELLER, *U. S. Navy*

Motto: Let no man despise the snake which has no horns,
for who can say it will not become a dragon.

—CHINESE PROVERB

HISTORIANS of the future, writing of these fateful years in which we live, may well record that 1948 and 1949 disasters in China set the stage for disaster in the United States. We in the Navy, who must think not only of the United States and its coastline, but of the world seaways and air-seaways converging on our shores, have a particular interest in Asia. We have just completed the greatest naval war of history to destroy hostile dominion over China and southeast Asia. Are we losing today what only yesterday we expended billions of dollars, hosts of ships and airplanes, and thousands of lives to preserve?

Both Russia and the United States have long looked on China and the fabulous Indies to the south with the deepest interest. Before the present Communist regime, the Czars of Russia saw in the northern provinces of China opportunity for growth to the great seas denied them in Europe. The Communists see not only this opportunity but the greater opportunity of world communism. Each Communist expansion provides but a base for starting the next. "We are living not merely in a state," says Stalin, quoting Lenin to reinforce his views, "but in a system of states, and it is inconceivable

that the Soviet Republic should continue for a long period side by side with imperialistic states. Ultimately one or the other must conquer. Until that end, a series of terrible conflicts between the Soviet Republic and the bourgeois States is inevitable."¹

According to the Committee of Foreign Affairs, 80th Congress, in the powerful document "Strategy and Tactics of World Communism," compounded from the Communists' own declarations, examination of these statements lead to some deeply disturbing conclusions:

- (1) The Communists have one goal—world revolution.
- (2) They assume that the revolution will be violent.
- (3) They are incapable of accepting the idea that peace can endure from now on, and they expect one more catastrophic war.
- (4) The Soviet Union is regarded as the main force of the revolution.²

China is important to the achievement of world communism, according to Lenin, for the "Far East is the back door of the capitalist and imperialist powers."

While we strive to lock the front door in Europe, the house is being entered from the rear in Asia. As was written in the Confucian Analects two millenniums ago, "The days and

¹ Letter to Comrade Ivanov, February 12, 1938.

² House Document 619, page 4.

A GRADUATE of the Naval Academy in 1925, Captain Eller served in the Pacific during most of World War II, and subsequently was Director of Public Information, Navy Department, Washington, D. C. He has twice won the Naval Institute's Prize Essay Contest, and has won Honorable Mention three times. At present he is attending the National War College, Washington.

months are passing away; the years do not wait for us."

Columbus in search of the wealth of the Indies voyaged westward with no livelier hopes than have stirred the minds of Americans in every generation looking to Asia. Scarcely had our War of Independence ended when the 55-ton sloop *Harriet*, out of Boston, and the larger *Empress of China*, out of New York, sailed on trading ventures to China. There lay riches. There dwelt an ancient, cultured, and talented people who produced silks, "Nankins," teas, lacquer, porcelain, carvings—all hungrily sought by Americans and gladly brought to them by American ships which, if fortune served them, might receive a quarter of a million dollars in a single voyage, from an investment in ship, outfit, and initial cargo of one-sixth that.

Changing times and the rapid industrial growth of western nations, including the United States, brought a decline in the relative importance of the China trade. Fabulous fortunes came to mariner merchantmen as late as the clipper ship era when on the wings of the sky such jewels as *Flying Cloud*, *Romance of the Seas*, and *Great Republic* raced around the Horn freighted with cargo for the gold fields of California and thence sped homeward by way of China. Fortunes continue to be made today, though on a lesser scale and with lesser romance than in the days of our stirring maritime youth. China in 1948 is of less importance to us commercially than she was a century ago. Tomorrow, with her vast population and boundless need for capital equipment, she could become in trade one of the most important areas to us on earth.

At times consciously, always unconsciously, America has realized what China means to her destiny. The Golden Land of Han was

the dominant power in Asia when savage tribes still roamed most of Europe. She has given the West many inventions, including probably the mariner's compass. She has demonstrated the possession of a mysterious formula that has bestowed upon her the power to live through a recurring cycle of greatness and decline. Other nations, like all living things, grow to maturity of greatness, then fade into death or permanent impotence. She alone holds the secret of finding in decay the spark that drives her upward again, youthful, vigorous, great.

Looked at in the dangerous short view, China is an industrially backward, disorganized, overpopulated, impoverished land, suffering many revolutions simultaneously, incapable of aiding us or harming us in this immediate time of peril. Looked at in the long view (and it may be much shorter than some think), after her necessary time of travail, accompanied by chaos and destruction, China will experience renaissance once more, becoming, as for most of her long history, a decisive force in Asia.

There are few reasons why this rebirth should not come to China; many why it should. She holds in rich measure those elements which, woven together and fused by the flame of national purpose, shape national greatness. She is situated in the north temperate zone, in the climatic belt whence sprang our own European civilization and most of the other civilizations that man has shaped. She has an extensive coastline with some of the world's first harbors on the world's greatest ocean. Within her boundaries are such vast and fertile lands that some twenty per cent of earth's population somehow find food, even though the farming is primitive and less productive than it might be made to become under a settled government with modern methods, machinery, and scientifically selected seed.

These 450,000,000 to 500,000,000 people—three times the population of the United States and more than twice that of Russia—have demonstrated a tenacity for living, a tireless energy in labor, a limitless skill in handicraft, and a social culture designed for everyday happiness in human contacts which have few if any peers in the records of other nations.

Anyone going to China and looking at superficials compares her very unfavorably with the United States. He sees incompetence in her dirt, her lack of hygiene, her scarcity of bathtubs, radios, television sets, telephones, and automobiles (which for some people are the measure of progress). He sees weakness in the illiteracy and poverty of much of her population, matched only in our own slums and tenant farms. He sees impotence in her deficiency in modern industry and her widespread canker of *cumshaw* and graft. He may come to a different conclusion, however, if he looks more closely at China of both today and yesterday, with her possibilities for tomorrow, and compares her with European nations of, say, a century or half century ago, in scientific and industrial development. Looking thus closely he may decide that the transformation that Japan accomplished in a generation and a half, and Russia in less than one, may well be accomplished even more speedily in China.

In their long history the Chinese have demonstrated remarkable skill in every field of human endeavor. Still today there is no nation that can match them in multiplicity of lovely handiwork: silks, embroideries, porcelain wares, jewelries, brasswork, artificial flowers, carved jade and ivory, wood and silver, lacquer, inlays, cloissone, furniture. To name Chinese handicrafts is to name beauty. A thousand generations of skill and culture animate their patient, tireless hands. They are creative masters.

Although they lack our scientific agricultural methods of this generation, the Chinese are masters, too, in farming, whether the measure be in quantity, variety of product, or the esthetic loveliness of a Chinese miniature garden with its dwarf trees and specially bred flowers. As merchants they combine skill in getting along with people and skill in merchandising to such a degree that they are the tradesmen of the Western Pacific from Singapore to Manila.

As voyagers they have conquered deserts, mountains, and sea. They are particularly able fishermen and seamen, as many in our Navy can testify after witnessing their junks ride out typhoons. Long before the Vikings dared their heroic voyages, the

Chinese ventured on longer ones in equally tempestuous seas to southeast Asia and India. To make their wanderings safer, they early invented the double bottom for their junks, one of their several contributions to the ancient art of the sea.

In social ethics and the relationship of man to man they are still today, despite all the unrest and chaos and misery in the Land of Han, probably ahead of any other great people. Buddha, the Teacher of Contemplation, Mohammed, the Prophet of Paradise, Christ, the Prince of Peace (though Christians have attained little enough of it), all promise the blessed hereafter to the pilgrim who has trod well the stony and troubled way of earth. Confucius taught a way of life for life itself that man may make pleasant, peaceful, and happy daily contacts with other men. Once in answer to a question on the hereafter, Confucius replied, "Until you are able to serve man, how can you serve gods?"

The Golden Rule is a foundation stone of Christianity, but only one of many such, all directed to well deserved rewards in the land of golden streets. The Chinese on the other hand are educated in a semi-religious code of ethics which in some measure enters into every human relationship—imperfectly, of course, since the Chinese, too, are human. It enters strongly enough, however, so that though they may be callous to suffering and death of those not in their immediate family (a characteristic in varying degree of most human beings), they attain a higher degree of happiness in their daily face-to-face contacts than most peoples. The ready smile, the childlike curiosity, the lightness of heart, the philosophic poise of the average Chinese, however miserable his worldly lot, are real, not artificial. They come to him from an ancient philosophy woven into the fibers of his being.

"The superior man," says Confucius, "holds righteousness to be of the highest importance. . . . He hates those who proclaim the evil of others. He hates the slanderer. The goal he sets for himself is perfect virtue, which is composed of gravity, generosity of soul, sincerity, earnestness and kindness. He begins to learn in his earliest days that youth when at home should be

filial, and abroad, respectful to his elders. He should be earnest and truthful. He should overflow in love to all, and cultivate the friendship of the good."

Whatever their backwardness in scientific and engineering invention today, the Chinese have a proud record in the past that may be repeated in the future. Among their many gifts to the Western World appear certain ones that have revolutionized our lives: movable type, paper currency, gunpowder, probably the compass that made possible the age of great discoveries starting with de Gama and Columbus. They have contributed greatly in textiles, in handicrafts, in fruits of the soil.

Although far behind Occidental nations of this century in engineering works, China once led all nations. Her great canal network (some 40,000 miles of these waterways are still in use), her system of paved roads and couriers that equaled those of Rome in efficiency while surpassing them in mileage, her mammoth earthen dikes harnessing her rivers of sorrow, her Great Wall winding wide and sturdy over mountain, valley, and desert a distance equal to that from New York to San Francisco—these are not works of an ineffectual race. As someone has said, "The soul of China is a Titan. Dwarf trees grow in China, but not dwarf souls." If anyone questions whether this tenacious skilful people can repeat such achievements, he has only to observe what they accomplished in the industrialization of Manchuria within a decade under a settled government and Japanese direction.

This statement leads us to some of the weaknesses of China. These exist partly in her graft ridden government, partly in the anarchic self-seeking of the privileged classes, partly in the impact of many revolutions striking her in the down curve of one of her ever repeating cycles of decay and growth, partly in a strange somnolence resulting in a measure from these observable forces, in other measure from unconscious realization that all this has been before and will be again, that human beings live and labor and die, that cycles rise and fall, that change comes inevitably, and that all flow on into eternity which ever appears different, ever remains the same.

"If the fleeting world is but a long dream,
It does not matter whether one is young or old,"

sighed Po Chu-i more than a thousand years ago. And a thousand years before him sang another poet in this ancient land of sun and sorrows,

"In infinite succession light and darkness shift
And years vanish like the morning dew . . .
Man's days are but a brief sojourn."

Men say the Chinese are not patriots. This cannot be true. One has only to talk with them to understand their deep love for China, their faith and culture rooted in centuries of greatness, their belief that the civilization of Cathay is the best that man has evolved, with more to give than to receive from the West. They serve their people ill politically, or not at all, in some degree because of an old custom. It is the custom to oppress financially, to graft and bribe. These faults, that exist in every country but are kept under control in our own, run wild in China today. The traditional habits of cumshaw or commission and devouring taxation have degenerated into a vicious drain on China's strength, just as similar evils have degraded some of our own municipalities. They destroy like a malignant disease.

China's citizens are not different today than in the past. Greed is an evil as old as Eden. Probably before the dawn of writing the Chinese had set down the duality of man in a proverb, the conflict of good and evil "Prisons are shut day and night, yet they are always full. Temples are open day and night, yet they are always empty." When controls are strong, evil is repressed; when weak, it gains ascendancy. Prominent in the controls is government, and, as Confucius noted, "Bad government is more destructive than tigers."

Corruption in office, like many other state ills, spreads riotously under a weak national government. Without checks to keep the disease in bounds, it becomes an epidemic. The social creature, man, goes with the crowd. A wave of corruption is one expression of mob psychology. A human reaction is, "This corruption is wrong, but everybody is getting his, why shouldn't I get mine?" Strong souls resist the tide. Weaker ones go



Official U. S. Navy Photograph

BEFORE THE COMMUNIST SWEEP

Commander of the U. S. Seventh Fleet visiting Generalissimo Chiang Kai-shek shortly after World War II.
The United States has always had a great and friendly interest in China.

along with it. They can be redeemed only by an equal wave of revulsion which may come from several causes, the most common and effective being the establishment of a strong central government which stamps out corruption by example and punishment. "It is the duty of the government," said Gladstone, "to make it difficult for people to do wrong, easy to do right." "Advance the crooked and set aside the upright, then the people will not submit. . . . Advance the good and teach the incompetent, then they will eagerly seek to be virtuous," observed Confucius; and at another time, "Let your evinced desires be for what is good and the people will be good."

China has been sick throughout this century, and before. Two great men, Dr. Sun and Chiang Kai-shek, almost succeeded in lifting her the first step out of the quagmire. They would have succeeded had it not been for outside interference that has continued to this day. Just when Chiang had unified China and she showed promise of reviving strength, Japan struck, first in

Manchuria, next in China proper. As for the Communists, like time they have worked ceaselessly to destroy through internal gnawing and external assault.

World War II, coming in part because of our failure to check Japan in Asia, in shaking the foundations of the world likewise aggravated China's ills. Her problems became more acute. It is possible that Chiang Kai-shek could not have solved them in any event. It is certain that the solution became almost impossible when the Communists, with vast stores of Japanese arms, intensified their pressure and with the aid of their comrades across the border got control of the industrial empire of Manchuria which has no counterpart elsewhere in China. (Manchuria provided the Communists more manufacturing facilities, and denied them to the Nationalists, than Chiang had in the rest of China or was able to get from other countries.)

Chiang, tough, sincere patriot, and resolute in his mistrust of the Communists, may by some miracle and sufficient aid come back

to provide the strong government which China needs, which she must have to start solving her problems and to become again a first power in the world.

Whatever Chiang Kai-shek may or may not accomplish, the Communists will provide the dictatorial government, direct and ruthless, that will solve the problems in the part of China they dominate. They know what to do, are doing it, and will continue to do it. Will they, in solving the problems and in bringing strength, bring blessings or otherwise to China and the world?

Some observers say that the Communists, like all past "conquerors" of China, will sink in the morass and be absorbed by the Chinese. In weighing this prophecy we must consider several differences between this conquest, if it may be called such, and those of the past. In the first place, this is not a subjugation by external armed forces, whatever the aid may be from outside, but a conquest from within, the conquest of an idea. This is true even though Moscow trained Communists lead and direct the fighting and subsequently the communization of the areas they take over.

Fragmentary evidence indicates that communization is proceeding at high speed following the fashion laboriously learned in Russia and recently perfected in central European countries. To begin with, workers and farmers are promised and given relief from taxes, and gain ownership of industry and land. Their most pressing problems are solved; they are given their heart's material desires. Why not? All can be taken away later. Give anything. Temporize as necessary for the moment. When the hour is ripe, all can be undone. Meanwhile, to insure that the backing is there to undo it, training schools are established so that promising youths may immerse themselves in the Doctrine.

Regardless of the efficient direction from outside, the communization of China rolls on essentially as an internal change. Organized and controlled by a few, with the great mass (as in Russia 30 years ago) passively accepting because of promised and some immediate temporary benefits, this is conquest of China by her own people. A new dragon has risen from the fields and villages,

hurling his coils around China. New masters take over from the old. Will they be less successful than native Communist dictators elsewhere, less cruel and ruthless and competent in bringing the masses into line? Will these few who merely displace another few be less successful in enslaving the many?

A second difference over past conquests exists in the industrial potential of the two halves of China. Wars today depend predominantly upon coal, steel, other minerals, and large industrial plants. Whatever her latent resources, Nationalist China south of the Yangtze is a weakling today compared with North China and Manchuria, the Ruhr of Asia, which with outside aid early fell to the Communists and was only in small part and temporarily retrieved at highwater of Nationalist operations.

A third difference is that the Mongols and Manchus were a handful of rude nomads who rode in to establish themselves as rulers of a people not only far advanced over them in civilization but outnumbering them as the waves of the seashore outnumber footsteps on the sand and eventually obliterate all trace of them. The pressure of Soviet Communism, a powerful force in Chinese Communist victory over and above any direct aid being rendered, does not derive from scattered nomads. It bears down vast and overpowering with the weight of one of the world's first nations back of it. Soviet Russia provides a base for Communism too extensive and powerful ever to be absorbed by even the tenacious culture of China. The python swallows the pig, and not the reverse.

Another group of prophets say the native Communists will not accomplish much because the Chinese lack organizing and administrative ability. All their past record negates this false concept. Their brilliant achievements, not in one period but in repeated golden ages of power, give promise of what they will do again. But more of this hereafter.

Still others say that China's problems will weigh down the Communists as they have the Nationalists, or at any rate that their gravity and complexity will delay solution for a generation or longer. As they put it, "Let the Communists have the mess. It is

good riddance from our shoulders. May it break their backs, and welcome to it." They also add that the character of the Chinese and the nature of their civilization both oppose Communism. No, Communism cannot get control of China. This rationalization, too, must bear closer scrutiny, for if the proponents are wrong, the disaster of tomorrow will be no less terrible because of our deliberate self delusion. Indeed, in face of the great danger ahead of us we might do well to heed the Chinese proverb, "Let no man despise the snake which has no horns, for who can say it will not become a dragon."

China's problems press upon her with the weight of centuries. So did those of Japan in the 1880's. So did Russia's in 1917. The solution for the Chinese rests in a powerful central government that will harness and give direction to the immeasurably powerful forces that lie latent in them. The Communists will cut the Gordian knot as they did in Russia. They know and ruthlessly follow Napoleon's dictum that "Exclusiveness of purpose is the secret of great success and great operations."

It is profitable at this point to compare conditions in North China-Manchuria today after World War II with those in Russia in and after World War I. In 1917 there existed a number of Russian Communist leaders, toughly trained by years of revolutionary activity in prison and out. When the corrupt Czarist government collapsed, some of these leaders were underground in Russia, some like Stalin were in Siberian imprisonment, others like Lenin were in Switzerland whence they were transported by the Germans to Russia to accelerate the breakdown of Russian power. These leaders had some backing in the Russian universities and among the liberal elite. They had followers on a small scale in the four industrialized areas around Moscow and St. Petersburg and in the Donetz and Dnieper basins. The total number of Communists added up to only a few tens of thousands, was for many years under a million, and to this day amounts in party members to not over six million, only three per cent of the whole Russian population.

Russia was a great amorphous mass of many peoples speaking many languages.

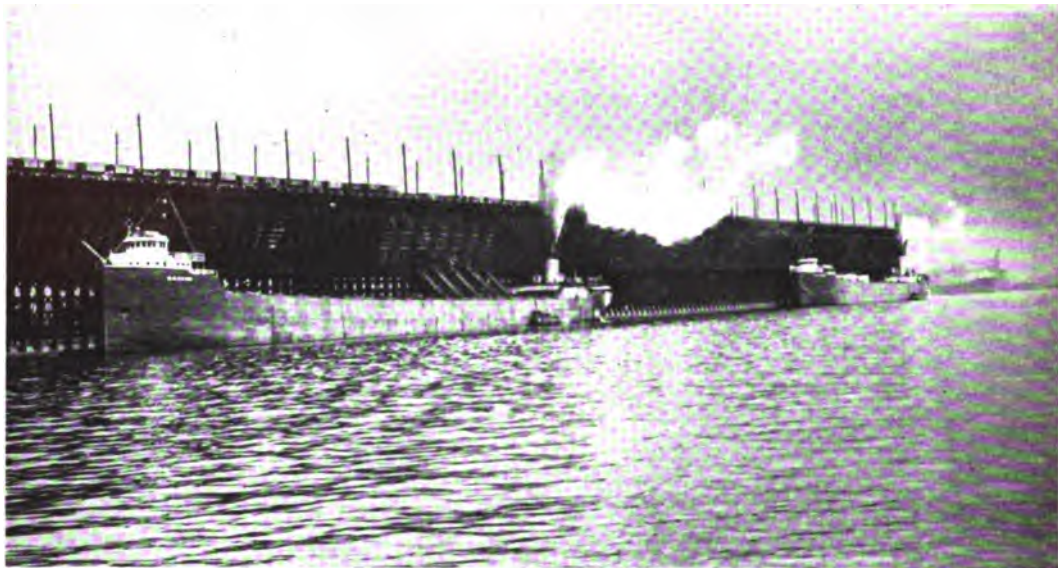
Sprawling across two continents, she had built some important railway lines, chief among them being the Trans-Siberian, but her railroads were then and are to this day but a beginning of what she needs. She had and still has few hard surfaced roads. As a consequence, internal transportation and communication are so difficult that they have been major handicaps in her development.

The picture so far sounds almost like China today. But we have more to add. Some eighty per cent of Russia's population scratched a living out of the soil, as in China of 1948, though with less efficiency than the Chinese but with larger reserves of arable land and therefore with better chance of expanding output, though collectivization might produce some expansion in China. Russia's basic industries were in their infancy, textiles alone having experienced considerable growth (as in China, and as in most countries in the early stages of the Industrial Revolution).

Records of 1917 list considerable mineral resources for Russia and some beginning at exploiting them in industry. Yet compared to what lay hidden, what was to be discovered and developed within 20 years, the known resources of 1917 were but the first buckets from a deep well.

Russia's coal resources in 1917 appear as 130 billion tons, of which she mined about 29 million tons annually. In 1937 the resources had grown more than 10 times to 1654 billion tons, mostly in Asiatic Russia, with about 130 million tons mined that year. Iron ore reserves went up 5 times, copper more than 10 times, other minerals similarly.

At the start of World War I Russia mined 9.2 million tons of iron ore, producing from it some 4.2 million tons of pig iron and an equivalent amount of steel from the pig. By 1937 these figures had tripled and were on the way to quadrupling. In 1917 uranium (which my 1941 reference book prosaically lists as "a rare white metallic element") was not dreamed of as a metal of world interest. Between then and 1937 Russia took sovereignty, previously loosely claimed by China, over the mountain girded land of Tannu Tuva, abutting the northwest tip of Mongolia. This land, little known to the



Courtesy Lake Carriers' Association

IN THE UNITED STATES, STEEL DEPENDS UPON TRANSPORTATION

A Lakes ore carrier loading iron ore from the Mesabi for the 800 miles run to the steel mills. In Manchuria, almost limitless supplies of iron ore, coal, and limestone abound almost side by side.

outside world, is said to contain many mineral deposits, including possibly rich ones of that "rare white metallic element," uranium.

"Disease," say the Chinese, "can be cured, but not destiny." Under a strong government vigorously pushing development, miraculous transformations of national power today can occur within a few swift years.

The picture of Russia in 1917-21 compares in many respects strikingly with that of China in 1945-49. There are the same groups of revolutionary leaders, long trained in sabotage, resistance, and revolt, but with the added strength of having been carefully schooled in tactics by successful masters of the art. There are the same small numbers of followers (small compared with the teeming millions of China) yet more dangerous and effective because they are relatively more numerous than they were in Russia and are tempered through decades of warfare. There are the same fears of Communism in outside nations which led the

Allies of 30 years ago to aid the White Russians with supplies and funds (on an ineffectual scale) and with military forces as well. The assistance this time to the anti-communists has been likewise inadequate. As for assistance to the Communists, there is a striking difference. They possess not only relatively greater numbers, but this time the whole outside world is not hostile. Backing them up to the north, aiding them along the thousands of miles of Russian-Chinese border, and pushing them on is one of the world's great powers, mother of their ideology, openly professed base for world communism.

There exists the same nucleus of industrial proletariat, somewhat but not measureably smaller in North China-Manchuria than in Russia thirty years ago. There exists the same predominantly agricultural society, with the mass of the population peasant farmers filled with a mass land hunger, eager to swallow the bait of land riches for their initial support of Communism—and we have no reason to believe that millions

not die as they did in Russia nor that will be more effective in resistance if the land is taken from them again. In China we have likewise the same awakening of peoples in the early stages of the Industrial-Scientific Revolution, an awakening accompanied by the pull of powerful forces, of ideologies, of crumbling structures, instability and fears and dark emotions which prepare a perfect setting for demagogues who would free a people from old misery by crushing them under another more brutal and cruel.

Those who seek to persuade themselves that the disaster in China is not a disaster may declare that there is one crucial difference (among others) between Russia of a generation ago and China of today. Russia had impressive mineral resources and an important start in the Industrial Revolution. China, they say, has neither. (It would be interesting to determine if the same people could make the same remarks about Russia not long ago a danger just a generation ago.)

Earlier in these pages we have noted how in 10 years the known mineral resources and the heavy industrial production of Russia had multiplied many fold. Strong evidence may be found that the same development can be seen in North China-Manchuria. Indeed, we already have record of startling development in Manchuria alone under the Japanese in the amazingly brief span of 8 years. Some 1500 years before coal was "discovered" in the United States, natives of Manchuria mined it for the manufacture of pottery. When Czarist Russia moved in during the last years of the nineteenth century building a railroad to Port Arthur, coal mining increased measurably. Other minerals attracted some interest. Practically all of the mining took place within a few miles of the railroad and its spurs.

The Chinese-Japanese war of 1894-95 and the Russian-Japanese war a decade later produced the power politics struggles of the twentieth century for the material resources of Manchuria. Following the Treaty of Portsmouth in 1905, and particularly in World War I, Japan made progress in developing this rich region, including discovery of many promising new mines. Subsequently, however, as Chiang Kai-shek gained strength

and progressively extended his authority northward, Japan realized the approaching danger of losing her sphere of influence in Manchuria. At the time she was steadily expanding industrially and understood more than ever before what the wealth of Manchuria meant to her destiny. Thus there occurred the Mukden incident and in 1932 the establishment of the puppet state of Manchukuo.

In the quarter of a century of Japanese paramount interest in Manchuria (but not the full control which began in 1932), she had extensively built up Dairen with its surrounding leased area of some 1200 square miles in Kwantung peninsula. To a lesser degree she had also developed the territory adjacent to the South Manchurian Railroad, expanding the production of the great Fushan open cut coal mine, for example, from about 200,000 tons annual output in the early 1900's to over 3,000,000 tons twenty years later.

Yet the resources of this "Ruhr of Asia" and her industrial potentiality had scarcely been touched when the Japanese took over completely in 1932 ready for large scale development. Although varying figures exist, the most common estimate of Manchurian coal resources in the summer of 1932 is 4,800,000,000 metric tons. Seven portentous years later, after swift general surveys, with new discoveries still coming in, the estimated reserves had multiplied four times to 20,000,000,000 tons and were still rising. Coal mined likewise shot up, approaching twenty million tons in 1939 and over thirty million tons in the year of Pearl Harbor. Fushan alone, the world's largest mine of its type, poured out a black torrent of over nine million tons annually, approximately one third of Manchuria's total output (and incidentally one third of the total coal output of all Russia had achieved in the last years under the Czars).

Anyone reading about China or her province of Manchuria in a book printed before the great world depression of the 1930's will learn that Manchuria, in addition to coal, had considerable iron deposits. Unfortunately, however, these were of low grade and therefore not competitive on an equal cost basis. Undeterred, the indus-

trious Japanese early built a large iron foundry on the South Manchurian Railroad at Anshan and developed a process for handling the ore. By 1932, the year they formed the puppet state, they were almost ready to commence making steel here, and subsequently did so on an increasing scale.

It is said in China that "The tiger cares nothing that the cow is lean." The Japanese would have gone into Manchuria for what resources it was known to have. That these proved many times larger only shows the possibilities in other parts of China once a stable, vigorous government begins to push development.

In the 1920's the total iron ore deposits of Manchuria, all of low grade, appeared to be something under 400,000,000 tons. In 1939 these reserves (with surveys still under way) had jumped eight times to over 3,000,000,000 tons. This total is a billion tons greater than the total reserves known to exist in all of Russia in 1917. An even more pleasing feature of the new discoveries were deposits amounting to 130,000,000 tons of rich ore containing sixty to sixty-five per cent iron. Much of this had been discovered in a single region along the Korean border, in the provinces of "Eastern Peace" and "Eastern Flower," previously not considered of importance in mineral deposits.

In our great United States we accept as commonplace the need to ship ore long distances to smelting and refining plants. Iron, for example, travels from the Mesabi Range (whose rich ores today are approaching exhaustion) hundreds of miles to the lake ports and inland steel manufacturing areas. Or it may travel much greater distances over the high seas, from far away Brazil and other lands to Bethlehem's plant in Baltimore. Copper ores may come to us from distant Chili. Some of our richer aluminum ores make the long sea journey from South America. It is sobering, therefore, to look on a mineral resource map of Manchuria of 1940 and to notice the mass of mineral symbols concentrated in the southeastern sector. There lie iron and coal side by side, and next to them limestone, magnesite, copper, aluminum. Zinc, lead, and oil shale also abound.

The Japanese were so excited over their

rich finds "of huge underground deposits" that in 1937 they formed the Manchuria Development Corporation to push the expansion of heavy industry. By 1939 it had unified the important industrial companies operating in Manchuria, had organized many new ones, and had greatly expanded production. Establishing her Five Year Plans, in the latter part of 1938 she reached the rate of installing a new pig iron furnace at the Showa works every two months. In the early years of the war she had built up pig iron production in South Manchuria to almost 2 million tons, in addition to a million tons of steel—all this from a standing start ten years earlier.

In China's province of Manchuria alone, then, we have one of the earth's great industrial empires of the future; in fact, one that already has a long start. Taking our belt of great mining-industrial-agricultural states from Minnesota east to Pennsylvania and New York (which besides these three states includes Wisconsin, Illinois, Indiana, Ohio, Michigan, New Jersey) and throwing in all of the New England states to boot, we obtain an area roughly the size of Manchuria. The natural wealth of this rich and populous section of the United States (something less than one half our population resides in this belt) may also be compared with the potential wealth of Manchuria which currently has a population of some 45 million. Under a powerful government, which the Communists should provide, there is every indication that the proved resources, the industrial capacity, and the population will all steadily increase.

This being the one area of China with a large agricultural surplus for export, and with lands still untitled, its population can increase to 70 million or more. One can easily understand why the Japanese so coveted Manchuria. It was rich, far richer than Japan, richer than their dreams or hopes. It provided not only the raw materials for the industrial empire on the home islands, but the possibility of a far more powerful empire on the great continent, leading Japan on to all Asia. Who now sees this dream of empire?

Such was Manchuria at the outbreak of World War II—a new center of world

power, revealed in a few years under Japanese rule. What will happen under Communist direction not only in Manchuria but in the larger and more populous domain of North China, no one can prophesy. However, as the Chinese might say, "Long robes can hide heavy feet."

The added possibility of industrial greatness resulting when we include North China with Manchuria is only a guess, but we can make at least a reasoned guess. No similar concentrated effort having been made to uncover hidden mineral wealth or to industrialize North China, it is impossible to say whether it will reveal similar resources to those of Manchuria (vast deposits of coal amounting to over 200 billion tons and some important deposits of iron ore are known to exist). Surveys and statistics indicate that a large expansion of known reserves will not occur. But for that matter they indicated the same results for Manchuria before the Japanese opened the secrets of the earth—secrets apparently not known to some of our current writers and speakers who still obtain their data from books that the passage of a few years has outmoded.

It would be folly to shut our eyes to the possibility of marked expansion of resources. To believe a business impossible is to make it so—for oneself, but not for the other fellow who does not so believe. Without attempting to investigate the possibilities in all minerals, we can take time to look at two in which impressive changes of estimated reserves have taken place quite recently.

Widespread surveys of China by Americans before World War I led to the conclusion that she had negligible oil resources. By 1937, however, estimates placed her oil reserves at 1,375,000,000 barrels. Explorations during the war uncovered other reserves including a claimed 400,000,000 barrels in Szechwan and lesser quantities in Sinkiang and Kansu, northern provinces that are inherently part of the Communist sphere. Oil shale has been known in Manchuria many years, but no evidence of petroleum in commercial quantities. Consequently the Japanese went ahead with construction of plants for extraction of oil from the rich deposits of over seven billion tons of shale. By 1936 they were producing

50,000 barrels of oil per month; by 1940, 250,000 barrels per month with a schedule doubling that rate to some six million barrels for the next year. That same year of 1940 they brought in an oil well in Jehol, southwestern province of Manchuria, portent perhaps of discoveries yet to come.

As late as 1934 able geographers and general authorities on China set forth her reserves of aluminum as small or "modest." Within a year new discoveries and clearer knowledge of existing fields resulted in estimates of 188 million tons of aluminum ore in what are now Communist controlled Shantung and Manchuria, enough to supply the world for a hundred years at the then rate of consumption. Within ten years these estimates had shot up again several times, the holy province of Shantung alone being credited with 271 million tons.

The possibilities of industrial development, then, in North China and Manchuria combined are far greater than in Manchuria alone. Perhaps all of China will come under Communist domination, perhaps only the northern half we have considered in this discussion. If only the latter, the Communists will control a quarter of a billion Chinese with their many skills and ready adaptability to mass industrialization, as already demonstrated in Manchuria, whose population consists essentially of Chinese immigrants and their descendants from Hopeh and Shantung. Considering what the Communists accomplished in a brief span in Russia, and the Japanese in a briefer one in Manchuria, we may with reason conclude that the Communists can develop this north half of China into an industrial nation for peace or war comparable to Russia of today, by the mid 1960's.

They will do it by the very means Stalin employed in Russia, as he himself related in a speech on February 9, 1946. After giving essentially the same industrial figures (brought up to 1940) as presented in the foregoing paragraphs on Russia, to demonstrate the major achievement of the Communists in preparing for World War II, he goes on to say that such an unprecedented leap from an agrarian to an industrial economy was achieved by forced industrialization and collectivization. In his words,



Photograph from Ewing Galloway, N.Y.

MODERN PROGRESS IN THE ORIENT

Hsinking in Manchuria was rapidly developing under Japanese initiative. The Communists are acquiring possession of extensive foreign developed territory throughout Manchuria and North China.

"The Soviet method of industrializing the country differs radically from the capitalist method . . . (which) begins with light industry. Since in light industry smaller investments are required and there is more rapid turnover of capital, and since, furthermore, it is easier to make a profit there than in heavy industry, light industry serves as the first object of industrialization in these countries."

After decades in which light industry accumulates capital, heavy industry gets its turn. Understanding this delay and understanding "that a war was coming, that the country could not be defended without heavy industry," the Communists, to save

the Soviet order from perishing, "began the work of industrializing the country by developing heavy industry. It was very difficult, but not impossible. A valuable aid in this work was the nationalization of industry and of banking, which made possible the rapid accumulation and transfer of funds to heavy industry.

"There can be no doubt that without this it would have been impossible to secure our country's transformation into an industrial country in such a short time."

As for collectivization, "In order to do away with our backwardness in agriculture and to provide the country with greater quantities of marketable grain, cotton, and

so forth, it was essential to pass from small-scale peasant farming to large scale farming for only large scale farming can make use of new machinery, apply all the achievements of agronomical science, and yield greater quantities of marketable produce."

Despite extensive resistance from "not only backward people," but "Trotskyites and Rightists" of the party, the true believers carried on unswervingly to victory.

By the same methods can China be transformed within the next decade and a half.

This does not purport to be a prophecy. It is merely an effort to discover what might be accomplished in the great empire of China and what we might have to contend with. It is part of the estimate of the situation that any wise leader digests in his mind to determine what his various courses of action may be and which will most likely bring him to his objective. Those who have written off China's problems as insoluble, who say that

even the ruthless Communists will bog down in them, may be right. It may be that this disaster in China is not a disaster to our policy of containing world Communism with its oft announced purpose of destroying the United States and all our cherished democratic institutions.

It may not be. On the other hand, it may be a disaster of the first magnitude. Unless we are sure it is not, and pending the remorseless unrolling of the future to show us what it is in fact, we would be advised to consider the possibility of the worst.

"The dark of night is profound and in its midst each man is alone in perplexity," says Lao Tze. The future in which we move is indeed dark and perplexing. However dark, our only salvation is in facing it with open eyes and without delusions. If there is a way through the darkness, only by looking carefully and preparing wisely shall we find it.



"THEY ALSO SERVE . . ."

Contributed by MR. HENRY A. ALLEN

What veteran of Pacific Ocean Area does not recall the whimsical insignia adorning the so-called non-combatant vessels of the fleet train? The sometimes wistful devices displayed by those forlorn auxiliaries who so often rode safely at anchor to serve the needs of the glory-seeking blood and thunder craft?

Reminiscence brings to mind one tanker which personalized its woes with a picture and legend on the side of its pilot-house. The picture was that of an Indian Brave struggling manfully to leave the spot though hopelessly handicapped by ball-and-chain shackled to each ankle. From a rounded posterior surface protruded numerous shafts and feathers of arrows. The legend consisted of the names of eight ships neatly printed. The seventh name was executed in gold. All were preceded by a star; the fifth by two stars.

Our curiosity overcame our suspicion of a booby-trap and we inquired after the meaning of the whole portrayal.

"Our war record," came the well-salted reply. "You smart guys put up flags and silhouettes to show all the planes and ships and even tanks you destroy. What chance have we got at the enemy anchored here? Naw, we're strictly on the receiving end. We sit here and you come barging alongside, slam in our plates, carry away deck gear and top hamper, fill yourselves with our fuel and go merrily on your way. "Those ships with the stars are the ones that have banged us up."

"Why does that ship rate two stars?" we asked (dumbly enough).

"Rammed us twice, naturally!" came the not too patient answer.

"Well," we went on, still doggedly curious and willing to hazard a guess, "what does a ship have to do to get its name in gold print—take more damage to himself than he does to you?"

"Naw," was the exasperated rejoinder, "he was the only son-of-a-sea-cook that put back and helped us repair the damage.

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS.)



Official U. S. Navy Photograph

BLIMP MAKING A CARRIER LANDING

During the 1949 Caribbean maneuvers, possibilities for increased range and usefulness of lighter-than-air craft in anti-submarine warfare were demonstrated by the operation of blimps from the U.S.S. *Sicily*, as pictured above.

DIRIGIBLES FOR HEMISPHERE DEFENSE

By LIEUTENANT J. GORDON VAETH, U. S. Naval Reserve (Inactive)

NAVAL strategic planning recognizes that the next war, if it comes, will be more than a battle between nations; it will resolve itself into a struggle between continents and those who control them. Global in concept, it will be continental or hemispheric in execution, particularly if the widely accepted possibility of initial enemy control of the European, Asian, and perhaps African land masses be realized.

It is evident, therefore, that in such an event United States naval operations would encompass as matter of fact responsibilities hemisphere defense of North and South America, transoceanic combat and supply operations, and the performance of high latitude (Arctic) missions. In the carrying out of these basic strategic considerations, especially in light of recent progress in electronics, ordnance, pilotless aircraft, high speed submarines, and the destructive application of atomic energy and radioactivity, the early detection and plotting of enemy sea/air/missile forces combined with the ability to oppose them with adequate strength will be the key to the winning or losing of the war.

The task of detecting and countering an enemy who may be anywhere in the Arctic, Atlantic, or Pacific areas would be herculean at the very least. It would require global scouting forces with adequate range, endurance, and facilities for extended continuous electronic search operations and with maximum mobility for rapid deployment. It is to fulfill these requirements that the large dirigible or rigid airship seems peculiarly adapted.

The helium filled dirigible, serving as a long range electronic sentinel, airborne early warning unit, anti-submarine craft, missile launching platform, meteorological station,

and carrier of radar equipped parasite jet planes which would be relatively unaffected by weather considerations, is basically a Navy weapon of global war and hemisphere defense.

Inflated with 10,000,000 cubic feet of non-inflammable helium, this 950 ft. long craft can serve a strategic and tactical purpose as a highly mobile (90 mph.) aerial aircraft carrier and electronic sentinel. With a cruising range of 12,000 miles, it is enabled to remain at sea for extended periods of time (weeks), refueling as necessary from Navy tankers, special airship tenders (with mooring masts), or from small expeditionary bases. With its stable platformlike operating characteristics and its useful load of some 140 tons, it can be fitted out with the latest radar and television equipment as a special electronic scout or airborne early warning craft. As required by the tactical situation, it is either a mobile or stationary naval unit, even capable of anchoring at sea. As a meteorological station, it can make its own weather soundings, report on atmospheric conditions, and issue forecasts. On an offensive mission, it is possible for the craft to utilize its stable characteristics as a platform for the launching of smaller missiles.

The airship's complement of jet aircraft, designed for airborne landings and take-offs, would lack the conventional landing gear. Like the Air Force's XF-85 (parasite fighter for the B-36), the dirigible-borne planes would mount a small retractable hook atop

COMMISSIONED IN 1942, Lieutenant Vaeth for four and one-half years was on active duty, including assignment to the Staff, Commander Fleet Airships, Atlantic. In 1946 he was sent overseas on a research mission to collect information on European airship and balloon construction and operating techniques. At present he is Scientific Research Administrator for the Flight Section of the Special Devices Center, Office of Naval Research.

The opinions or assertions in this article are the private ones of the author, and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.



Official U. S. Navy Photograph

POST-WAR AIRSHIP—ZP-M

The XM-1, of the same post-war type as shown above, has flown for 170 hours without refueling and proved itself markedly superior in habitability and sea-keeping characteristics.

the fuselage immediately in front of the pilot's canopy. This hook would probably constitute the landing gear in its entirety except for a small skid provided in place of wheels along the underside of the fuselage for emergency ground or carrier landings.

Landings to the airship carrier can be effected with relative ease and lacking those mishaps frequently attending surface carrier wave-offs and landing procedures. Landings to airships are made by "hook-ons" whereby the heavier-than-air pilot flies his plane beneath the dirigible and engages his extended fuselage hook with a trapeze protruding from and beneath the airship. In inclement weather, he could approach the trapeze by means of a radio beam mounted thereon or by use of an airborne type of GCA (radar operated Ground Control Approach).

The rigid airship has endurance and range—about 12,000 miles for the 10,000,000 cubic foot ship. In terms of hours at cruising speed, this craft, some 3,000,000 cubic feet larger than the *Macon* or *Hindenburg*, could operate without refueling for a week at the least; actually its refueled endurance would be considerably extended beyond one week by anchoring at sea, hovering, or flying a search pattern very slowly for extended periods of time. Even the Navy's XM-1

(a small 750,000 cubic foot blimp) has flown continuously and *unrefueled* in excess of 170 hours, or more than a week!

Refueling in flight would materially increase the endurance of a rigid airship; refueling and servicing from airship tenders, aircraft carriers, and expeditionary bases would make possible extended operations at sea limited primarily by crew fatigue and major overhaul requirements. Aerial refueling could be accomplished by pumping fuel aboard from a surface vessel or by hoisting gasoline and provision containers aboard while the dirigible maintains position overhead.

Rigid airships have refueled and been provisioned by mooring to and basing from the Navy tender *Paloka*, landing on the flight deck of the carrier *Saratoga*, and utilizing airship expeditionary bases and mooring masts. For optimum utilization of dirigibles by the Fleet, such sea and expeditionary basing operations would be renewed, utilizing doubtlessly the expansive and unobstructed flight deck of the largest carriers.

The rigid airship has mobility—a speed range from 0 to 90 miles per hour. It can be rapidly deployed and, at twice a carrier's speed, proceed to danger or alerted areas where special electronic surveillance is neces-

sary. Unlike surface craft, it is relatively unaffected by land or ice masses such as are found in Arctic regions and can provide naval surveillance therein.

Lighter-than-air craft performance actually improves in colder areas. Airships, like surface craft, are displacement vessels and operate on the application of the Archimedean precept that buoyancy is derived from the weight of fluid displaced. Airships are sustained aloft through the buoyancy arising from the weight of the air they displace. Inasmuch as cold air is denser and heavier than warm air, airships derive increased lift in northern latitudes.

Northern operations do not operate totally to the benefit of airships, however; the advantage of increased lift is partially offset by high wind and severe icing conditions encountered there. The problem of airship icing has been the subject of intense study and forms the basis of a recent special report on the subject by the National Advisory Committee for Aeronautics. This study has so far generally indicated that airships in flight are not nearly so susceptible to icing dangers as was originally supposed. Operated with due regard for seasonal variations in winds and icing conditions, employment of dirigibles in Arctic regions increasingly appears feasible and tactically important.

The rigid airship has facilities—a military payload to include radar, other electronic gear, parasite fighter planes, armament, and meteorological equipment, all secured to or installed within the airship's frame.

This rigid frame or skeleton of aluminum girders gives rise to the name "rigid airship." It serves to distinguish this craft from the "non-rigid airship" or blimp, the hull of which consists of 3-ply rubberized cotton fabric with no internal framework. A blimp maintains its shape by virtue of the pressure of the helium contained within, a rigid airship or dirigible by its internal framework. A rigid airship hull consists essentially of a number of circumferential rings joined together by longitudinal girders extending from bow to stern. Inside are suspended as many as 16 individual helium cells. Around the skeleton is secured a linen cover which is laced and doped to the framing. Helium, like any other gas, expands and contracts in response to heating and cooling;

the outer cover of all airships is therefore painted aluminum or silver to reflect the heat of the sun and thereby reduce to a minimum the solar effect upon helium temperature.

The framework of a rigid airship permits imposition of unusual loads by providing a structure to support them. For this reason, it has been demonstrated since the end of World War I that large dirigibles can carry, launch, and recover airplanes. The American naval rigids *Akron* and *Macon* each carried a complement of five fighters and had a built-in HTA (heavier-than-air) hangar. These craft plus the honorably retired *Los Angeles* landed and launched their parasite planes some 3,000 times without mishap.

The ability of rigids to carry their own supporting fighters is extremely important from tactical considerations. Every military air force has as a high priority the making of its aircraft the least dependent as possible on weather conditions. The dirigible represents a promising partial solution to this problem. Comparative carrier-dirigible tests might well indicate, if performance on the *Akron* and *Macon* is any criterion, that adverse weather jet aircraft operations are more easily conducted from airships. The number of planes which go into the sea during operational carrier landings is not inconsiderable; accidents of this type should be eliminated in airship "hook-ons."

Take-off from a rigid airship is accomplished by disengaging the airplane's hook from the dirigible's trapeze; the parasite noses down and quickly picks up flying speed. This launching technique obviates the need for a plane to make a carrier deck take-off run and struggle into the air. Before the advent of JATO and carrier flight deck catapults, the difference in airship and carrier take-off techniques attributed to the dirigible-based plane the ability to carry some 40 per cent greater gross weight than a carrier based aircraft could lift off the flight deck. Reduction of this advantage has resulted from JATO and catapult development; however, even this may in turn be offset to some extent by elimination of heavy retractable wheels and substitution of a landing hook on the airship launched plane.

Additionally, airplane launchings from an

airship can be made without reference to the "wind across the deck" factor, airship airspeed being the determining consideration. This obviates the need for heading the dirigible into the true wind in order to effect launching or recovery of its heavier-than-air complement. Night landings and fog would present relatively few problems. In the case of night operations, airship illumination requirements would be simple; fog would be overcome by electronic aids and by climbing of the dirigible through fog strata to clear altitudes.

It is considered feasible to operate as many as 10 and perhaps 15 jet parasites from a 10,000,000 cubic foot rigid. In contrast to previous hangar housing within the hull, dirigible borne fighters of the future would be suspended underneath so that the airflow around the airship and over the planes' wings would provide lift and cause them to become partially self-supporting.

Jet aircraft of today have, of course, different performance characteristics from the reciprocating engine planes carried on the *Los Angeles*, *Akron*, and *Macon*. Certain engineering modifications of the trapeze arrangement and design of the airship parasite fighter with due consideration for its special application, however, will enable development of airship "hook-on" techniques in keeping with jet performance. In at least two aspects, however, jet fighter operations from dirigibles should be simpler; visibility is improved and the danger of the propeller striking the trapeze is eliminated.

These airship-carried planes might serve an anti-submarine purpose such as was served so effectively by the aircraft of the World War II escort carriers in their mid-Atlantic battles with U-boat wolf packs. The anti-submarine efficacy of lighter-than-aircraft has already been demonstrated. From 1942 to 1945, U. S. Navy blimps, small kinsmen to the rigids, escorted 89,000 surface craft without the loss of a single such vessel to U-boat attack. These blimps operated from Nova Scotia to Rio de Janeiro, on the U. S. East, West, and Gulf Coasts, in Africa, and in Europe with an operational readiness of 82%—high for wartime aircraft operations. Main drawback of blimps was their inability (through range limitations)

to stay with a convoy during all phases of its transoceanic crossing. This, the rigid airship could do and extend thereby lighter-than-air anti-submarine coverage from the coastal waters to the mid-ocean areas, while providing its own heavier-than-air attack-killer support.

Meteorology and weather—probably man-made weather—will continue to be of major importance to naval operations. The operation of advanced weather stations in wartime is an essential, and the operation of rigid airships for this task holds definite promise. Speedily mobile, such craft could follow or remain with storms, record weather data, and with the use of special balloons and equipment even engage in studies of the upper atmosphere in localities normally inaccessible to ground parties and ships.

Vulnerability is entirely a function of use. Blimps, for instance, are admittedly vulnerable to enemy aircraft fire, but during World War II they demonstrated that with proper deployment and assignment to areas in which friendly air superiority existed they could turn in a valuable performance as part of the anti-submarine team. Similarly, intelligent naval utilization of rigid airships would exclude such craft from operations in active combat areas where they would be subject to constant enemy attack. Instead, designed as long range, high endurance, and mobile scouts, they would operate primarily as electronic sentinels, standing radar, communications, and meteorological duty in remote Arctic, Atlantic and Pacific regions. In such a capacity, they would provide efficacious electronic coverage of immense oceanic areas, releasing valuable ships and aircraft for combat duty in areas where the enemy is known to be present. This type of advanced scouting represents little risk to the airship and would enable maximum radar coverage of an area with a minimum of ships, aircraft, and personnel. Even in the event of the destruction by the enemy of an airship electronic sentinel, in the South Atlantic, for example, the craft would have performed its mission and justified its existence by disclosing the presence of enemy forces in that area. Wartime attrition is an accepted fact and the loss of a dirigible (\$15,000,000 approximate mass production

cost) with a crew of only 100 would be a small price to pay for location of the enemy and consequent advance alerting of U. S. forces.

Rigid airships are no sitting ducks, however; the German Zeppelins of World War I proved that! During that conflict, these hydrogen inflated, weight reduced and consequent strength reduced "crates" flew directly over Allied guns and tangled with British and Allied planes. Shot full of holes and leaking highly combustible hydrogen, most nevertheless succeeded in returning from England to Germany; despite their almost suicidal hydrogen inflation, only 32% were destroyed by direct enemy action.

Tactical policy of today would avoid such hand to hand close range airship combat by assignment of missions to remote yet strategically important theaters of operation. In the event of attack by enemy aircraft, the rigid airship will have its own brood of radar equipped jet fighters for defense. With these planes and with defense stations located at strategic points about its hull, the non-inflammable helium filled dirigible should be capable of giving a good accounting of itself in a defensive action—should one become necessary.

Helium is actually a fire extinguisher. Navy lighter-than-air experience has shown that the gas possesses not only inert qualities but a capacity for extinguishing fires aboard airships as well. Carried in individual fabric gas cells, which are inflated under slight pressure, helium diffuses and leaks through holes slowly. Normally, there is no internal helium pressure at the bottom of a rigid airship gas cell. The cell is usually only partially inflated; the helium contained within, being lighter-than-air, rises to the top. The absence of the gas from the lower portion of the cell results in an absence of pressure which, from a vulnerability consideration, means that bullet or other holes in the lower portion will cause virtually no helium leakage. Even at the top where helium pressure is the greatest, leakage is so slow that damage to rigid airship gas cells has in the past gone unnoticed for hours and sometimes days. Gas cells, in fact all

parts of a rigid airship, are accessible in flight and structural or fabric damage can be repaired in the air.

To summarize then, the electronic sentinel and airborne early warning dirigible would have no business in actual combat with the enemy except as an interception resulting from its scouting assignments. Even the loss of one airship as the result of successfully performing these assignments would be tactically expedient as having determined the presence of enemy forces. But, as long as it remains possible, perhaps probable, that rockets or other missiles with armor penetrating fuses will pierce an airship and emerge unexploded from it and as long as the helium filled craft has its armament, protective planes, and radar with which it can detect the enemy at extreme ranges, such loss should be far from taken for granted.

The Soviet Union may already possess some of these ships; Russia has helium resources and post-war newspaper stories from Moscow have officially mentioned extensive Soviet lighter-than-air experimentation and endurance flights. Airships have been seen over the Russian capital and recent USSR newsreels have contained blimp sequences.

The rigid airship which, since the dismantlement of the sister-ship of the *Hindenburg* in 1940, has been considered as dead as the dodo, today has renewed naval significance. DeForest, Hovbaard, Kettering, Milikan, and others comprising the finest engineering brains in the country have unanimously reported to the Secretary of the Navy that rigid airship construction is sound engineering wise and that such craft can be designed, built, and operated with a reasonable margin of safety. The Germans demonstrated the ability to operate such craft with reliability and efficiency. Recent electronic and jet aircraft development give the craft a renewed naval value for extended electronic search and early warning employment.

United States Navy planning must necessarily revolve about global war and hemisphere defense considerations. In this picture of world-wide naval operations, the rigid airship has a strategically justified place.



Official U. S. Army Photograph

THE FRIGID WILDERNESS, RUSSIA'S GREAT ALLY

In planning for his "three months blitzkrieg," Hitler forgot the lessons of previous winter campaigns in Russia.

STALIN AND HITLER

(Part II). The Road to Stalingrad

By VICE ADMIRAL KURT ASSMANN *of the former German Navy. Translated by*
CAPTAIN ROLAND E. KRAUSE, *U. S. Navy*

THE DECISION of Adolf Hitler to attack Soviet Russia without doubt had a decisive import on the outcome of World War II. Consequently the question as to when and for what reasons Hitler made this fateful decision will always be one of greatest importance for historical research. To reach a solution we must start with a brief survey of the development of German-Soviet relations during the first phase of the war which ended with the victorious German campaign in France.

As noted in the previous article, "The Pact With Moscow," after the conclusion of this pact Hitler gave strict orders to avoid anything which might cause mistrust in Russia and might endanger the German-Soviet understanding. Until the summer of 1940, this political course appeared a compelling military necessity to him; that is, until Germany was able to obtain a favorable decision in the west, it had to maintain its protection of the rear in the east as had been done by the Moscow treaty. Hitler believed it all the more necessary to follow this course with scrupulous exactitude because he mistrusted from the beginning Russia's faithfulness to the treaty, and he always reckoned with the possibility that Russia would sometime break the treaty and join the ranks of Germany's enemies. The small regard he himself had toward faithfulness to treaties must have served to increase his concern.

A whole series of instructions and statements of the Fuehrer indicate his attitude in this regard. It did not take long for the Russians to start cashing in on the political concessions granted by the Germans in Moscow. The first Soviet advance was in the direction of the Baltic Sea; at the beginning of October, 1939, the Baltic States were forced by diplomatic pressure to hand over valuable Baltic Sea bases. In this connection

the German Foreign Office gave out the following statement: "The strengthening of Soviet influence in the Baltic provinces is taking place in complete agreement with German state policy."¹

How the shift in the balance of power occasioned by the pact with Moscow operated to the disadvantage of Germany in the Baltic Sea is indicated by a German-Soviet incident in naval warfare at the end of October. It caused temporary but at the same time very serious discord in Moscow. Due to strong Soviet pressure, the German Naval Staff was obliged to limit its warfare against the contraband trade, which ran from Finland and the Baltic States via Sweden to England, to the area west of 20°E. longitude. This meridian cuts the Baltic Sea about in the middle in a north-south direction. The Soviet request had no basis in existing international law, but the matter was considered of high political importance by the Russians. As Molotov explained to the German Ambassador, German naval action east of here caused "sur-

¹ War diary of the German Naval Staff.

AFTER MANY years of active duty, Vice Admiral Kurt Assmann was appointed Head of the Historical Section of the German Naval High Command in 1933. In addition to editing the official history of German Naval Warfare in World War I, he was lecturer on naval strategy at the German Naval Academy. His official duty gave him access to the official documents, and he had close personal contact with the Germans in high command, especially Grand Admiral Raeder.

Captain Krause, as Assistant U. S. Naval Attaché at Berlin, became acquainted with Vice Admiral Assmann in 1938-1940. During World War II he served in the campaigns of Morocco, Sicily, Salerno, Guam, Leyte, Lingayen, and Iwo Jima. Subsequently he has been on duty in the Office of Naval Intelligence.

prise and strongest apprehension" in the Soviet government. Apparently German naval operations in the eastern half of the Baltic Sea appeared to the Russians as an intrusion on their sphere of interest as recognized in the treaty of Moscow. This incident was resolved only by the German Naval Staff giving in all the way. Subsequent attempts to revise this provision by new negotiations with the Russians foundered on the opposition of the Fuehrer, who directed that the matter should not be reopened.

Even though German naval warfare in the Baltic Sea was limited by Soviet interference, nevertheless it also realized considerable advantage from the German-Soviet treaty relationship. Soon after the beginning of the war, the Russians offered the use of the harbor of Poljarnoye on the ice-free Murman coast for a German naval base. Even though the expectations which the German Naval Staff attached thereto were never fully realized, since the Russians in all measures pertaining thereto were most careful that their relations with the western powers should not be seriously affected, nevertheless this base was of great value to German naval warfare and especially for German shipping. It was here that the large German liner *Bremen* sought refuge on her break-through to a home port and from whence, materially aided by the Russians, she was able to continue on to Bremerhaven. When German steamers left Murmansk to return to Germany, the Russians would not permit British ships to leave until twenty-four hours later, so that the latter would not have the opportunity to call up British warships by radio. The Soviet Navy also gave valuable assistance in fitting out, pilotage, ice information, etc., for the German auxiliary cruiser "*Ship 45*" which made the passage from Poljarnoye through the northern passage to the Pacific Ocean. This undertaking would have been impossible without such assistance. When the Germans no longer desired to use Poljarnoye after the occupation of Norway, the Soviet Chief of Naval Staff answered the thank-you telegram of Grand Admiral Raeder with these words, "The Russian Navy is happy that it could be of service to the Germans."

On November 30, Russia opened hostilities against Finland. This Soviet aggression

called forth very great displeasure amongst the German people who had retained a feeling of comrades-in-arms and a lively sympathy for the Finnish people from World War I. By direction of Hitler all German offices were strictly cautioned to observe correct neutrality. State Secretary von Weizsaecker directed the German missions abroad to avoid any anti-Soviet note in the commentaries on this conflict but rather to indicate approval of the Russian advance. The course of this war, which dragged in the beginning, led to an under-estimation of Russia's strength by Germany. In an estimate of the Red Army which was made by the German General Staff at the end of December, 1939, it was stated that the Red Army indeed represented a mighty military instrument by reason of its numbers but that it was inadequate in organization, equipment, and transport, and that the officers were young and inexperienced. The battle efficiency of the troops in a serious fight was doubtful; the Russian mass was not equal to taking on an army equipped with modern weapons and superior in leadership. The Finnish campaign did in fact show up numerous defects in the Soviet armed forces; the Russian leaders, however, soon took to heart the lessons learned and applied themselves with all their might to correct them. In fact, the principal reason for Russia's initial failure in the war with little Finland was that the Soviet government had not taken it very seriously and had commenced hostilities with inadequate forces. Later, when the Russians employed stronger forces, they were able to break through the fortified Mannerheim line without much difficulty. They were quite proud about this. The terms of peace given to Finland at the end of the war were moderate; certainly her fate was very much better than the Baltic States, which later on were simply annexed. Surely this moderation toward Finland was not done out of consideration for the sympathy which Finland enjoyed in Germany, but because it appeared desirable to the Russians to end the conflict due to the danger of intervention by the western powers.

Meanwhile, at the beginning of February, 1940, the first German-Soviet economic agreement was concluded. The Russian counter-demands, in armaments as well as otherwise,

were high. On the other hand the Germans had to admit that the stipulated Soviet deliveries were made on time and in full amount. When certain Russian counter-demands in the naval field were troublesome to the German Navy High Command, the Fuehrer directed, on January 26, 1940, that delaying tactics be employed, and he gave this significant reason—he hopes “with a favorable development of the war to get around this request altogether.”

In the early morning of April 9, shortly after the first German landing had taken place in Norway, the German Ambassador notified Molotov of the German-Norwegian operation. The Soviet Foreign Minister expressed great understanding for the German action when he received this memorandum, and wished the German forces full success in their “defensive measures.” In this connection Count Schulenburg reported that the German advance in Norway was received by the Soviet government as a “release from the danger of war with the western powers,” and that it had resulted in a noticeable change in the Russian attitude, which had been rather unfriendly of late, even in the matter of economic deliveries.

The notification of the German offensive in the west, which was likewise made a few hours after it had begun, caused no noteworthy reaction in Moscow. All that Molotov had to say to Count Schulenburg in this connection was that he had no doubt of the success of German arms.

In Article III of the pact with Moscow, the contracting powers pledged themselves to prior mutual consultation in the event that one should embark on a major action which might affect the interest of the other. Germany had given no notification to Russia before the beginning of either the Norwegian campaign or of the offensive in the west. To have done so would have been contrary to military interests, since the success was greatly dependent on surprise of the enemy, and consequently strictest secrecy was the law of the hour. Russia was not vitally affected by events in the west. However, Scandinavia was a different matter; Russia could not be unconcerned in a shift of power politics in that area. Since the effects of the German aggression were adjudged favorable

for Russia in Moscow, Molotov had no reason to invoke Article III on this occasion. However, he now omitted on his part every prior notification to Berlin, as was the case in June, 1940, when the Soviet government began the annexation of the Baltic States. Although these countries belonged to the Soviet sphere of influence according to the pact with Moscow, Germany had considerable interest in their fate. Germany was the strongest Baltic Sea power; she had concluded non-intervention pacts and economic agreements with all three Baltic states, and during the last year she had received from them deliveries, principally food supplies, valued at 200,000,000 marks. It was two days after the Russian troops had moved into the Baltic States, on June 17, that Molotov deemed it necessary to advise Count Schulenburg of the Soviet action. The reason which he gave to the German Ambassador was astonishing; it was done, so Molotov said, “to make an end to all the intrigues by which the western powers have attempted to sow distrust between Germany and Russia in the Baltic States!”

It must have caused particularly bad feelings in the German government when the Soviet occupation was extended to south Lithuania, which belonged in the German sphere of interest. This was a definite violation of the Moscow treaty, and moreover was contrary to the express assurance which Molotov had given Schulenburg that this area in Lithuania would in any case be excluded from such measures as the Russians were taking. Not until four weeks later, on July 13, did Stalin, in recognition of the German claim, make representation to the German government with the plea that it relinquish claim to this area to Russia for a financial consideration in view of “the good relations existing between Germany and Russia.” The German government hesitated a long time until finally, under strong Soviet pressure it was prepared to sell its claim for money. For the time being it maintained silence on the Russians’ use of force in the Baltic States, but by no means forgot about it. Later on it was made part of the grievances by which Hitler attempted to justify the attack on Russia. In literal adherence to the Moscow treaty the German For-

eign Office instructed the German missions abroad that the events in the Baltic States were the concern only of Russia and those states.

On June 23, Molotov asked to see the German Ambassador, and notified him that the Bessarabia problem could no longer be postponed. Count Schulenburg replied that such a pronouncement was unexpected by him, and he invited attention to the large German economic interests in Bessarabia. In the course of the conversation Molotov informed him that Russia also laid claim to Bukovina since it had a Ukrainian population. This claim was something new entirely. Formerly Bukovina had been a part of Austria-Hungary; it was not part of the territories which were recognized as being in the Soviet sphere of interest by the Moscow treaty. On June 26, the discussion was continued. Molotov declared that Russia was prepared to limit its claim to north Bukovina. He requested German diplomatic support in Bucharest. This time the Russian action took place in loyal agreement with the consultation paragraph of the Moscow treaty. It is well known that the German government met in full the Soviet wishes, and by strong diplomatic pressure in Bucharest moved the Rumanian government to give in. This was a very valuable service which it rendered the Soviet treaty partner, and it dared hope that Russian gratitude therefor would not be lacking.

These weeks saw important territorial changes which took place in eastern Europe in favor of Soviet Russia. Outwardly these occasioned no change in the political relationship between Germany and Russia. That it had considerable influence on the inner attitude of the Fuehrer toward Soviet Russia, however, will soon be recognized. In the note which the German government delivered to Moscow relative to the outbreak of war on June 22, 1941, the German Foreign Minister confirmed that in the treaty negotiations in September, 1939, the Soviet government had declared that it had no intention of "occupying, communizing, or annexing" the states lying within its sphere of interest, with the exception of territories given over to Russia in the partition of Poland. If Ribbentrop gave weight to this verbal assurance, then

it was fatal that he did not get it in writing.

Meanwhile, there had also occurred in the west a prodigious turn in the history of the world. The military resistance of France had collapsed; the armistice of Compiegne had ended hostilities. Even before the fighting was over, and before the Soviet aggression in the Baltic States, Adolf Hitler informed the Commander-in-Chief, Navy, on June 4, that after the downfall of France he intended to reduce the army by releasing the older men and, in particular, skilled workmen. Then he would turn German armament to building up the Air Force and the Navy. On another occasion he voiced the opinion that the Army had accomplished its principal task in this war.

After the armistice of Compiegne, the Fuehrer withdrew to Feldberg in the Black Forest. He was preparing an important Reichstag speech which was to contain a comprehensive offer to the British government. At this time he had not yet abandoned the concept that he could make peace with Great Britain on the basis of the new order which he sought to establish on the continent of Europe. Now that Great Britain had lost not only her own continental front, but also her only ally on the mainland after the victorious German campaign in the west, he hoped that the British government would be ready to open negotiations. In these days, however, a number of reports arrived from England which indicated that the Churchill government had no thought whatsoever of concluding peace with him and was determined to continue the war to the end. Thereupon Hitler changed his mind. The session of the Reichstag was postponed to July 19; the speech was rewritten, and it was only briefly indicated that Germany was ready to come to an understanding with Great Britain.

It was at this time that the German decision to attack Russia was born. A number of important factors contributed thereto. Adolf Hitler had concluded the treaty with Moscow because circumstances, as he saw them at the time, appeared to force him in this direction. He was never for it heart and soul. His innermost conviction, and the objective which he pursued from the beginning of his political career with all the fanaticism of his passionate nature, was always the

fight against Bolshevism as the mortal enemy of occidental culture. The necessity of going along with the Soviet Union was a heavy burden to him. After the war in the west had turned in Germany's favor, the situation was fundamentally changed. It appeared to Hitler that the danger of a two-front war had finally been removed. As might be expected from his purely continental training, experience, and attitude, he viewed the situation of Germany from a military point of view exclusively. No doubt he had obtained from the lectures of Grand Admiral Raeder a superficial concept of the influence of seapower in war. Since it did not strike a spark within him, it remained something strange and uncanny. Consequently Great Britain should be induced as soon as possible to make peace with him. It was during these days and for this purpose that the preparations for Operation "Sea Lion"² were begun. However, the necessity for bringing the war to an early conclusion did not appear to be indicated to him. The thought that the enemy might be able to reestablish the front in the west by utilizing British seapower does not appear to have entered his head. He made numerous statements which indicate that he considered the United Kingdom was already licked but was too foolish to realize it. On what could Britain pin her hopes? The Fuehrer gave his answer to this question in a conference with the Wehrmacht High Command on July 21, 1940. "Great Britain can hope for aid from (a) the United States of America, or (b) Russia. The entrance of the latter into the war would be particularly disagreeable on account of the air threat to Germany. Even though Moscow views the great successes of Germany with a tearful eye, it has no desire to enter the war against her. However, it is our duty to ponder seriously the American and Russian question."

This was the first reference of the Fuehrer to the possibility of a conflict with Soviet Russia. Russia's ruthless overpowering of the Baltic States, and her action against Bessarabia and Bukovina which took the German government by surprise, served to spotlight the threatening danger to Germany of Soviet imperialism. Adolf Hitler had

high regard for the personality of Stalin. However, he was disturbed by the ruthlessness and energy with which the Russian dictator had exploited the political advantages which he had derived from the pact with Germany and which had developed for him due to the war in Europe. To be sure, they were the same methods which Hitler himself was wont to apply when opportunity offered. It was only a small step until Hitler arrived at the realization that Stalin was a dangerous opponent in his own battle for supremacy in Europe—and one who must be eliminated. Hitler had little respect for the sanctity and binding nature of treaties. What if Stalin should hold them in similar low esteem? Suppose that one of these days, after the completion of Soviet armament, Stalin should break the pact of Moscow and fall on Germany in alliance with Great Britain and the United States? Was it not Hitler's duty to anticipate this danger before the United States was ready to enter the war? Would it not perhaps even be possible "to kill two birds with one stone" in Moscow?

In point of fact, witnesses from the Fuehrer's headquarters testify that the old Napoleonic idea to counter Great Britain in Moscow, to wrench from her hand "the last continental weapon which she could use against him," had a rebirth in Hitler. The collapse of France had not sufficed to make Britain willing to accept a compromise peace. If now, so Hitler reasoned, Britain should have to abandon hope of aid from Russia, then she would have to give in. On the other hand, as the Fuehrer explained to the Commander-in-Chief, Navy, at the time when the Soviet move in the Balkans commenced, under all circumstances "the last continental opponent must be eliminated before he can combine with Great Britain."

At first glance this reasoning is astonishing since it would be difficult to imagine a better means of effecting that which was to be prevented—that is, throwing Stalin into the arms of Churchill—than a German attack on Russia. Hitler's reasoning becomes understandable, however, when one considers that he was firmly convinced of a speedy collapse of Russia and believed that thereby the foundation for a subsequent British-Soviet alliance against Germany

² Cover name for the invasion of England.

would be removed forthwith.

The prior course of the war had been an unbroken chain of brilliant military victories. Poland had been overrun in eighteen days; the daring action against Norway had been completely successful, despite some difficulties; the French armed forces, whose combat effectiveness had been rated very high in Germany, had succumbed to the German onslaught in a few weeks. Up to this time the German sacrifice of men and material had been almost negligible. Considering the sensitive nature of Adolf Hitler, it was hardly surprising that this had developed in him a psychosis which threatened to remove from his grasp the measure for the possible and the attainable. It led him, in boundless overestimation of his own ability and that of the forces created by him, to believe that fate had destined him to accomplish all things which he undertook, even those which were unattainable by the ordinary mortal. His guiding motive had always been, "Difficulties exist to be overcome." He had never yet bowed before them. Now he voiced a new and more dangerous sentiment, "Nothing is impossible for the German soldier!"

What did he think of Russia? In his book, *Mein Kampf*, he had termed Soviet Russia a "clay colossus," which one only needed to touch to make him fall over. No doubt he had read the estimate of the Red Army by the German General Staff, mentioned earlier in this article, and had taken note of it. The course of the Russian-Finnish war appeared to have confirmed it. In Hitler's opinion the campaign against Russia would be a "blitzkrieg," and would end in the collapse of the latter within *three months*.

Here in these fateful "three months" we have the key to the whole situation. If actually only three months were required to bring about the collapse of Russia, then there was of course no time for Great Britain and Russia to concentrate against him. If in fact only three months were needed, and he was relieved of the threat in the east, then there was always time to turn with all forces against Britain—should that still be necessary.

It is probably not true that Hitler had at this time formed the decision to attack

Russia. However, the plan was taking shape; he directed the Army High Command to make preparations for the campaign as a possible course of action. The date had also been set; the Wehrmacht was to be ready for action by May 16, 1941. The German troop movements to the east commenced in August 1940. Later on Hitler expressly termed them German counter-measures to a Soviet attack. It is an open question which side began troop concentration on the German-Russian border. In point of fact, in the Soviet advance into the Baltic States, the Russians left nothing to chance, and in order to guard against every eventuality they had moved stronger forces into the western border area than were required for this action. At that time Germany had been occupied with preparations for Operation "Sea Lion." The Soviet troop concentration was felt as an acute threat to the rear, coming as it did just during these weeks. When Grand Admiral Raeder, who had as yet received no official notice of the plan to attack Russia, asked the Fuehrer in August as to the purpose of the German troop movements to the east, the latter replied that they were "a large-scale deceptive operation for 'Sea Lion.'" It conformed to the procedure of the Fuehrer not to unfold his plans in the Russian matter to the Commander-in-Chief, Navy, until they were ripe; he knew that the latter would take a negative stand.

As a consequence of the Soviet annexation of Bessarabia and North Bukovina, Hungary and Bulgaria were able to promote their claims in July, 1940, for territorial revision against Rumania as regards Transylvania and Dobrudja. This led to German-Italian conferences with the heads of the Balkan States concerned. On July 29, Molotov asked the German Ambassador for information concerning the purpose and substance of these conferences. Count Schulenburg replied that Germany had advised Bucharest to meet the Hungarian and Bulgarian wishes. The negotiations were brought to a conclusion by the decision of the Vienna court of arbitration. To get the Rumanian government to agree to the loss of territory she suffered thereby, Germany guaranteed the boundaries of what was left of Rumania.

On August 31, Count Schulenburg notified

the Soviet Foreign Minister of the conclusion of the Vienna accord. Molotov received the announcement with cool reserve. He explained to the Ambassador that it constituted a violation of Article III, Consultation Pact of the Moscow treaties. By direction of the Foreign Office, Schulenburg on September 3, sought to justify the German move in that the Reich government held that Russia could have no further special interest in Rumania after the regulation of the Bessarabia and Bukovina questions, and that Germany had to give the guarantee in order to induce Rumania to agree to the concessions demanded. Molotov refused to accept this explanation on September 9; Germany had not acted loyally—she must know that Soviet interest in Rumania and Hungary was still strong. Molotov emphasized that the whole foreign press had assumed that the Soviet government had been previously consulted. The whole business was one of great importance; he would reply in writing.

The Soviet reply was issued on September 21 in the form of a memorandum and was rather sharp in tone. It maintained that Article III had been violated. It proposed that this Article should be dissolved by treaty in the event that it was inconvenient for Germany; as long as it stood, it should be respected. It was maintained that the German guarantee for Rumania was directed against Russia. There is no doubt that the Soviet government was correct in this assumption.

During these days the Three-Power Pact between Germany, Italy, and Japan was concluded. On September 25, the Soviet government was informed thereof. In connection therewith Molotov was informed of the desire of the German government to hold conferences in Berlin. Molotov asked Schulenburg for the text of the Three-Power Treaty, "inclusive of the secret clauses." The German Ambassador replied that the text had been published and that there were no secret clauses. Molotov advised that he would carefully consider the provisions of the treaty.

While these political negotiations were in progress some unpleasant disturbances in the economic field arose. As has been previously indicated, the Russians insisted that all deliveries be made on a reciprocal basis. At the end of September, 1940, they asserted that

Germany was 80,000,000 reich marks in arrears; they threatened to stop deliveries. Difficult negotiations ensued. It was a purely business matter, but the Germans also attached political significance to it; this added fuel to the growing discord.

On September 26, Grand Admiral Raeder had a lengthy discussion with the Fuehrer as to the future course of the war. The conference was in private where Hitler did not have to give consideration to the views of other parties and thus was more receptive to calm deliberation. With all the power at his command the Grand Admiral attempted to hold Hitler to his conception that Britain was the chief opponent of the war. Every deviation from this course which would result in a waste of force must have fatal consequences. In deepest earnestness Raeder warned against an adventurous campaign into Russia. He also cited important moral considerations: a binding treaty had been concluded; to break this unceremoniously would deprive Germany of every political consideration and trust throughout the whole world. Instead of this course Admiral Raeder recommended transferring the focal point of the German conduct of war to the Mediterranean, to force, in alliance with the Italians, the British to abandon their positions there during the coming winter and to open the way to Suez and the Arabic lands of the Near East to German-Italian arms. This plan, which required German forces then available and scarcely employed, was indeed the law of the hour at that time. In this case also "two birds could be killed with one stone." The overthrow of British power in the Mediterranean would have been a deadly blow to the British Empire; and with the extension of the German sphere of power to the Suez, Syria, Irak, and finally also Turkey, the position of Germany in the war would have been strengthened to such a degree that she would no longer need to fear an attack from Russia. Grand Admiral Raeder, who supported this thesis in the discussion, expressed it in somewhat different form, having consideration for Hitler's concept of the war. He told the Fuehrer that "an attack on Russia in the north would then probably be no longer necessary." The Fuehrer appeared to be strongly impressed as a result of this

conference. He told his Naval Aide that the deliberations of the Grand Admiral had been very valuable to him; he could now "check his own concept and see if it is correct."

At the beginning of October, Germany sent a military mission to Rumania. In order to allay Soviet mistrust, von Ribbentrop instructed Count Schulenburg to inform Molotov that a military occupation of the country was in no way intended, but that the German measure was limited to a military mission, as had been requested by Rumania. At the same time the German attitude toward Finland aroused Soviet mistrust. German troop movements were under way in order to forestall a renewed Soviet attack on Finland, by securing the nickel mines at Petsamowhich were vitally necessary for the German war economy. Molotov asked the German Ambassador concerning the purpose of these troop movements. The Russians also complained about alleged German arms deliveries to Finland. They maintained that the Germans delayed delivering the agreed war material to Russia but gave it to Finland and other states! On October 13 the German Foreign Minister addressed a personal letter to Stalin. He proposed a further extension of German-Soviet cooperation and the inclusion of Russia in the Three-Power Pact. The letter included an official invitation of the Reich government for Molotov to come to Berlin. The latter hesitated, but on October 22 Stalin thanked the German Foreign Minister and accepted the invitation.

Since this occurred on the basis of the proposals formulated by von Ribbentrop, the authorities in Berlin looked forward to the visit of the Soviet Foreign Minister with hopeful expectation. On October 23, the German Naval Staff noted in its war diary: "In view of the current situation, a war with Russia no longer seems probable."

The Berlin conferences with Molotov took place on November 11-14. The principal points of discussion were the political inclusion of Russia in the Three-Power Pact, the Soviet demands on Finland, the German-Soviet differences in the Balkans, and the Dardanelles question. In conjunction with the Three-Power Pact, the Fuehrer sought to divert the Soviet expansion aims from the

Balkans toward Iran and India. Since the United Kingdom had already lost the war—thus reasoned Hitler—the best opportunities for Russia were in Asia, at the expense of the British Empire then in process of dissolution. He recommended to Molotov an early agreement with Japan.

Molotov appeared to be receptive in the main to these arguments of Hitler. At that time the Germans did not have a definite conception concerning the details of a political cooperation of Soviet Russia with the states subscribing to the Three-Power Pact, in particular as concerns Asia. These negotiations therefore had the character of a preliminary discussion.

Molotov took a very definite stand as respects Finland. Soviet demands had not been satisfied in the treaty of peace concluded in March; these must now be made good. Hitler stood up for Finland; the latter must not be attacked again despite her position in the Soviet sphere of interest. He reasoned that, in view of the great interest of the western powers in Finland, they might again make the Baltic a theater of war by their military intervention, in the event that Russia renewed her attack on Finland. Molotov vigorously denied the reality of this danger; with extraordinary tenacity he reverted again and again to the Soviet demands on Finland during the several days of conference. The Fuehrer adhered to his stand. This subject was finally dropped without an agreement having been reached.

In the Balkans, Molotov demanded German agreement to a Soviet guarantee for Bulgaria to offset the German guarantee for Rumania. The Fuehrer replied that in his opinion it was of first importance whether Bulgaria desired such a guarantee. He knew nothing of any such wish on the part of the Bulgarian government. When Molotov pressed the matter further, he replied evasively that he must discuss the matter with Mussolini. Thus an adjustment of the mutual concepts was not achieved in this case as well.

The Germans broached the Dardanelles question and offered the Russians German diplomatic support, but only to the extent of abrogating the Treaty of Montreux and assuring by a new agreement the unhindered passage of Soviet warships through the

Straits in the future. Molotov replied rather coolly that this was something which Russia hoped to regulate in negotiations with Turkey. Moreover a paper agreement was inadequate; Russia must have "realities." At this time, in Berlin, Molotov had not yet voiced a definite demand for bases on the Straits. However, there is no doubt that even at that time he saw in such bases the desired "realities."

It was a world-wide order which was discussed in Berlin. It embraced not only the problems of eastern Europe but also the auspices of a new order for Asia. Even though the outward aspect of the conference was harmonious, the Soviet statesmen were heartily received, and Hitler personally did everything to make their stay in the Reich capital as agreeable as possible, nevertheless the political result was all in all anything but satisfactory. No concrete agreement whatsoever was arrived at; it was more like an interchange of ideas in which mutual concepts often were sharply divergent and unrecconcilable differences seemed to arise; yet the Russians and Germans adjudged the results of the conference in an entirely different manner. Hitler considered that the discussions had not only widened the existing breach between Germany and Russia but had made reconciliation impossible. He viewed it as the "end"—the failure of a last attempt to forestall the impending break. This German concept was not clear to Molotov or he would probably have been more disposed to a meeting of minds. He considered the conference as a beginning for further extended diplomatic negotiations in which to regulate in detail and on a satisfactory basis the German-Soviet relationship, and in particular to examine the possibilities of Russia joining the Three-Power Pact. He counted on further discussions between himself and Ribbentrop in Berlin or Moscow. As early as twelve days after the conclusion of the conference, on November 26, he had a carefully worked-out memorandum delivered in Berlin, in which were laid down the Soviet conditions for such collaboration.

These conditions must have strengthened the impression in Berlin that the breach was final. Molotov demanded the withdrawal of the German troops from Finland, the conclu-

sion of a mutual assistance pact between Russia and Bulgaria, Soviet bases on Turkish territory at the Straits, and the renunciation by Japan of her coal and oil concessions in northern Sakhalin. There was no German reply to this Soviet memorandum. Even before an answer could have been received, and without regard to German objections, the Soviet government dispatched General Secretary Sobolev to Sofia to negotiate concerning the Soviet security requirements. The Bulgarian government was unsympathetic thereto.

On December 18, the first directive of the Fuehrer concerning Operation "Barbarossa"³ was issued by Fuehrer Headquarters to the Wehrmacht. Even then it was only a preparatory order for an eventuality. However, Hitler's decision was now firm; the visit of Molotov had decided that. Once again, on December 27, the Commander-in-Chief, Navy, warned the Fuehrer against beginning the Russian campaign prior to the overthrow of the United Kingdom. It was at this conference that Hitler advised Raeder that in the current political situation—meaning "the inclination of Russia to interfere in Balkan affairs"—"the last continental opponent must be eliminated before he can combine with Great Britain." Consequently the Army must be brought up to necessary strength; thereafter the Navy and Air Force would get first priority. On the following day the Grand Admiral informed his staff: "The political situation has changed due to the demonstrated unreliability of Russia in the Balkans and necessitates building up the Army."

Now there was no stopping the wheel of fate as it rolled toward the abyss. As has happened often in the history of the world, the Balkans were the theater in which apparently irreconcilable political interests clashed. The German Balkans operation, which was to bring relief to the Italian campaign against Greece, then bogged down in Albania, and to forestall the creation of a Balkan front by the British in their current effort to aid Greece, was in preparation. Based on information which indicated vigorous diplomatic activity by Russia in the Balkans and which moreover told of Rus-

³ "Barbarossa" was the cover name for the campaign against Russia.

sia's intention to attack Rumania, Hitler was convinced that Germany must reckon with Soviet interference in the execution of the Balkan campaign. In particular he had grave concern for the Rumanian oil fields.

Moreover, there were unpleasant developments in the economic field which reflected on the political scene. About the first of the year extensive discussions concerning mutual deliveries took place. After numerous difficulties had been overcome and it appeared that the negotiations could presently be concluded, the Russians suddenly declared that they could not sign unless and until Germany should agree to the cession of the German-Lithuanian border strip which they had long desired. Circumstances obliged the German government to agree. On January 10, in connection with the economic agreement, the treaty was signed by which the disputed area was turned over to Russia for an indemnity of seven and a half million gold dollars. It was in these days that Hitler remarked to Grand Admiral Raeder: "Stalin is a cold-blooded extortioner!"

At the beginning of January, 1941, strong German troop formations marched through Hungary toward Rumania. When the Russians asked the purpose of this move, Ribbentrop directed Count Schulenburg to answer in an evasive manner that the German troops were intended for a possible operation against the British in Greece. On January 17, warnings were issued by the Soviet Ambassador in Berlin, as well as by Molotov to the German Ambassador in Moscow, that the appearance of foreign troops in Bulgaria and on the Straits would violate Soviet security. Molotov maintained he had reliable information that Germany intended to occupy Bulgaria and the Straits; the British would attempt to anticipate this move, and thus Bulgaria and the Straits would become a theater of war. He told the German Ambassador that it was strange that the Germans had not yet replied to the Soviet memorandum of November 26. Ribbentrop replied to Molotov that the German troop movements directed against the British had nothing to do with the Straits, and that the Soviet proposals of November 26 were being discussed with Italy and Japan; he added that the German government adhered to

that which it had told Molotov in Berlin. Thereupon the Soviet Ambassador in Berlin reiterated to State Secretary von Weizsaecker the Soviet warning of November 17; the German reply was unsatisfactory and not in agreement with this view.

On February 27, Ribbentrop directed Count Schulenburg to inform Molotov that Bulgaria would join the Three-Power Pact on February 28, and that the British action in Greece would require that German troops enter Bulgaria on March 1. Schulenburg reported to Berlin concerning his conference with Molotov that the latter received the news with "evident concern," and that Molotov again confirmed that the security of Russia would suffer if German troops entered Bulgaria.

On March 25, under strong German pressure, Yugoslavia announced her adherence to the Three-Power Pact. Two days later the government of Prince Paul, whose Minister-President Zvetkowsch had signed the treaty, was overthrown by a *putsch*. Although it was not entirely clear what stand the new Yugoslav government would take toward the Three-Power Pact, Hitler assumed that the break was a *fait accompli* and directed the extension of the impending Balkan campaign to include Yugoslavia. Although there was no concrete evidence, it was assumed in Germany that Soviet intrigue was behind the *putsch*. At any rate whether this was the case or not, the developments in Belgrade were a greater trial to German-Russian relations than anything before. On April 4, Molotov announced to Count Schulenburg that Russia had concluded a friendship and non-intervention pact with the new Yugoslav government. On Schulenburg's reply that this treaty appeared to be very untimely, Molotov countered that it served only the cause of peace. He voiced the admonition that Germany too should maintain the peace with Yugoslavia; the minister of that country had informed him that the new government would sanction adherence to the Three-Power Pact. Schulenburg doubted this; Molotov persisted in his view.

The Soviet government could have been in no doubt that Germany must view the conclusion of the Russian friendship pact

with Yugoslavia as the sharpest affront against the German treaty partner which the Russian authorities had allowed themselves thus far. If the latter were really concerned to live in peace with Germany, they were certainly playing with fire. They were warned on good authority! The American Undersecretary of State, Sumner Welles, reports⁴ that as early as the last months of 1940 reliable reports concerning an impending attack by Germany on Soviet Russia had reached the U. S. State Department. Early in January, 1941, these reports indicated a terminal date of the following spring, and took on such weight that, after consultation with the President, Welles deemed it advisable to officially inform the Soviet Ambassador in Washington, Mr. Umansky. The latter was deeply concerned and promised to transmit the communication to Moscow immediately. Five weeks later Sumner Welles advised Umansky that further reports had come in which fully confirmed the previous information. The British transmitted similar warnings to Moscow.⁵ Moreover the Russians must have been aware of the preparations for the German offensive. The weight of opinion in the German Embassy in Moscow inclined to the view that the Soviet government did not want war, despite the fact that they fed oil into the fire with a series of unfriendly acts; rather, the Russians believed that Germany in her current situation was forced to take this unfriendliness. The optimistic estimate of the war situation which prevailed in leading circles in Germany following the great successes of 1939-1940 was never shared by the Russians. When Molotov was in Berlin, he made a wisecrack flavored with strong sarcasm. After Hitler and Ribbentrop had repeatedly explained to him that Britain had already lost the war, he said he took cognizance thereof, "that the Germans assumed that the war against England had already actually been won. If, therefore, as had been said in another connection, Germany was waging a life and death struggle against England, he could only construe this

as meaning that Germany was fighting *for life and England for death!*"

On April 6 the German Balkans campaign got underway. On notification by Schulenburg concerning the entrance into Yugoslavia, Molotov replied that it was "extremely deplorable" that despite everything the extension of the war could not be avoided. On April 9 the Greek Thrace army capitulated, and on April 13, Belgrade fell.

On the same day a remarkable incident occurred in the Moscow railroad station. After lengthy discussions in Rome and Berlin, the Japanese Foreign Minister Matsuoka had signed in Moscow a Neutrality Pact between Japan and Russia, with the consent of the German and Italian governments. On April 13 he left Moscow. Stalin and Molotov appeared unexpectedly at the depot to see him off. Stalin asked for the German Ambassador. When the former caught sight of him, he embraced him and said: "We must remain friends, and you must now do everything in your power to this end." Then he turned to the deputy German military attache, Colonel Krebs, and remarked in a loud voice: "We will maintain our friendship with you under all circumstances!"

A numerous crowd witnessed this scene at the depot; it was a great, planned public demonstration. It was to show the world the surprising turn which during these days had taken place in Russia's attitude toward Germany in the political as well as the economic field. The German Embassy in Moscow credited this turn to the extraordinary successes which the German forces had achieved as early as the first week of the Balkan campaign. Stalin, being a Georgian, had personal knowledge of the difficulties of the mountainous terrain and had assumed that the German conquest of the Balkans would be delayed for weeks. He was greatly impressed. It seemed indeed that "nothing was impossible" for the German Wehrmacht. In consequence the Russians were alarmed lest this mighty military machine might now turn irresistibly on them; all other considerations and objectives became secondary. Their representatives were directed to negotiate and yield all along the line. The Soviet economic deliveries which had proceeded in a hesitating manner during the

⁴ "The Time for Decision" (Armed Services Edition), page 205.

⁵ Viscount Maugham in the London *Sunday Times* of February 22, 1948.

first months of the year, apparently due to the political estrangement, now went ahead again full blast. The German representatives were assured that if Germany so desired she could have five million tons of grain during the next year. All German stipulations in the protracted discussions of the final German-Soviet boundaries were suddenly accepted, in contrast to the former stubborn resistance. The Finnish-Soviet relations eased. The Russian press was directed to comment in a particularly friendly fashion on whatever concerned Germany. At the beginning of May, Stalin personally took over the office of the Chairman of the Council of People's Commissars which Molotov had previously held. According to Count Schulenburg this was done because Stalin desired good relations with Germany under all circumstances, and that he felt that Molotov had not proven equal to the situation. Schulenburg reported that nevertheless Molotov was firmly in the saddle; that the latter's attitude toward him was as usual very friendly; and that Stalin and Molotov were guarantee for the Soviet faithfulness to the covenant. On May 10, the Soviet government withdrew diplomatic recognition of the Norwegian, Belgian, and Yugoslav missions still remaining in Moscow.

The changed attitude of Soviet Russia was of course carefully observed in Germany; Adolf Hitler also expressly mentioned it a number of times. He told the Japanese Foreign Minister that "Russia would not be attacked if she continued to conduct herself as friendly as in the past." However, this was only camouflage by which Hitler endeavored to allay the apprehension of Matsuoka concerning German-Soviet tension in the hope that Japan might be induced to enter the war on the side of the Central Powers at an early date. His decision was made and nothing could move him therefrom. The fateful words, "too late," thwarted all Russian endeavors to ward off the threatening disaster!

On April 28, Count Schulenburg was in conference with Hitler. Forcefully he apprised the Fuehrer of the changed attitude of Russia: the Soviet government does not contemplate an attack, but rather is prepared for more extensive cooperation with the Axis and for further concessions in the

economic field. His representations in this conversation fell on deaf ears, just as all of his previous and subsequent reports met with no response. War was decided on.

However, the Balkan campaign delayed the launching of the attack by more than five weeks because the forces there employed were required for "Barbarossa." D-day, which had originally been set for May 16, was postponed to June 22. This delay was probably of decisive importance for the outcome of the whole Russian campaign. Napoleon, too, had started his march into Russia too late in the year. Naturally, when signs of a German attack became more threatening day by day, the Russians took certain mobilization and security measures; their deployment had commenced. Yet, when May 16 passed and the storm had not broken upon them, the Russians breathed easier. They believed that they were spared this threatening calamity—at least for this year—because with a later opening day the German advance would encounter the Russian winter. Prior security measures were maintained but not appreciably extended.

At the beginning of June Count Schulenburg reported that Russia would fight only if attacked by Germany; Soviet policy was unchanged in its endeavor to maintain as good relations as possible with Germany. To be sure, the situation was considered serious, all military preparations were being quietly made, but so far as could be seen they were exclusively of a defensive nature. On June 14 the Moscow *Tass* Agency published an official Soviet declaration. It decried the widespread rumors of war and emphasized that both parties would conscientiously abide by their treaties. This declaration was kept a secret in Germany, although Molotov himself handed it to the German Ambassador.

At 9:30 P.M., June 21, Count Schulenburg had his last audience with Molotov prior to the outbreak of war. Molotov asked him why Germany was dissatisfied. He spoke to him about the rumors of war and regretfully called attention to the fact that Germany had taken no notice whatsoever of the *Tass* announcement and had not even published it. He begged Schulenburg to tell him what had occasioned the current regrettable con-

dition. The German Ambassador replied that he was sorry to say that he was not informed thereon and would refer the matter to Berlin. At the time this conversation took place he was already in possession of the text of the German declaration of war. Only a few hours later he had to deliver it to the Soviet Foreign Minister. Simultaneously the Soviet Ambassador, Dekanosov, received it in Berlin.

The German advance into Soviet Russia commenced in the early morning hours of June 22. It struck the Russian forces with the full weight of tactical surprise. It was reported that even in the night of June 21–22 Soviet grain trains crossed the German border. A member of the German Embassy in Moscow told the author that in his opinion the Russians, despite all warnings, believed up to the last that the Germans would not actually strike, for the simple reason that they could not imagine that in her current serious situation Germany would be so foolish as to take on as an additional enemy the Russian colossus.

At the end of May, 1941, after the victorious Balkan campaign, German soldiers cast their eyes from the shores of Peloponnesus and Crete across the sea to the southward where lay the coasts of Cyrenaica and Egypt—out of sight but yet within reasonable reach. Millions of other German soldiers were concentrated on the borders of the occidental world ready to march into the endless spaces of an enormous, strange country. Here Germany stood at the parting of the ways; signs at the crossroads even indicated the way. One pointed to the southward and was plainly marked with the letters "SUEZ." On the other, which pointed to the eastward, the letters were blurred and illegible. Germany's leader was intent on pursuing his course to the eastward; he believed he read on the sign, "MOSCOW." Actually the word printed there read "STALINGRAD."

It seems like a last call of fate that the German soldiers were led to the southward—to the Peloponnesus and Crete. They had gone reluctantly. The German Fuehrer had little concern for the Mediterranean. He had gone there because he believed he was compelled to do so after the failure of the Italian

campaign in Greece and the participation of the British. By taking advantage of this favorable situation there was yet time to grasp fate by the forelock and direct the course to the southward. But the hand of providence was rejected; the course remained set for Moscow.

Considering the results which this decision brought not only to Germany but to the whole world, the question naturally arises; was there no one who could tear the Fuehrer from this fateful design? Insofar as the author has been able to establish, *all* were against it. The General Staff was most skeptical of Hitler's announced "three months." The author has been informed that even the Reich Foreign Minister was opposed to this campaign. On April 28 the Foreign Office prepared a detailed memorandum for Hitler, in which were noted the grave and dangerous consequences of this step for Germany. However, relative to Hitler, all of these men worked under a severe handicap. It was not only the Fuehrer principle of the authoritarian state, the motto, "There is one who directs and all others have to obey," which contained them. It was not only the absolute despotism of the almighty dictator which suppressed those who were of contrary opinion from bringing the strongest possible pressure to bear on the Fuehrer by threatening to resign. The chain of unbroken political and military successes which had developed in Adolf Hitler himself a sense of infallibility was not without its effect on their relations to this man. By every outward appearance, Hitler had always been right heretofore. All had gone well and had developed as he had predicted it, not only in the great political moves of pre-war days but also in the daring military operations of the war. Contrary to all rules of warfare the Norway undertaking had been completely successful. Before the western offensive in May, 1940, the General Staff had had gravest doubts that the German armoured formations would prove equal to their assigned task, had feared that the thrust against the enemy center would be brought to a halt in a few days and then develop into a war of position. However, the attack plan which Hitler had personally evolved was the one which had brought

decisive victory. Was it surprising that after such experiences, many—even the most competent and sober—came to believe that Providence had endowed the German Fuehrer, Adolf Hitler, with a sort of “sixth sense” which enabled him instinctively and at the right moment to make the correct decision, and that this belief stifled sound calculation in the German General Staff? Today, when the whole *Fata Morgana* has evaporated in thin air, it is difficult to appreciate this condition and to make it sound plausible to others, but matters appeared otherwise when Hitler was at the peak of his successes in 1941.

To be sure, there were a number of men in Germany who were filled with deepest anxiety for the future, by reason of the manner in which these successes had been achieved. They recognized the inner harm and the dangers of the system. But they were without influence on affairs or, because of their doubts and forebodings, had been previously eliminated.⁶

Grand Admiral Raeder was one of the chief opponents of the campaign against Russia and one of those who most emphatically represented his attitude to the Fuehrer. The heaviest responsibility for the conduct of war against England rested on him as Chief of Naval Staff. He was therefore also primarily concerned lest the war take a false turn—away from England to other objectives. It must strike a student of the German Naval Archives that Raeder last warned the Fuehrer on December 27, 1940; that is, five months before the beginning of “Barbarossa.” In consequence the author asked the Grand Admiral whether he had subsequently been convinced of the necessity for the campaign against Russia, or whether he abandoned further representations because he considered them futile. Grand Admiral Raeder replied as follows: “At that time the Fuehrer had announced his ‘unalterable decision’ to wage the eastern campaign despite all objections. Thereafter, according to past experience, further warnings were entirely useless unless they were pointed to an entirely new situation. As Chief of Naval Staff, I was never convinced

of the compelling necessity of ‘Barbarossa’.”

It is conceivable that the events of spring, 1941—the conquest of Greece as a *point d'appui* for a Mediterranean campaign against Great Britain, and the consequent reversal of the Soviet attitude—had given an “entirely new situation.” Apparently, however, it was not considered such. Moreover it is not at all likely that the Grand Admiral could have turned Hitler from his course had he made new representations. Yet it remains to be considered whether the character of Grand Admiral Raeder would not have gained in history had he given voice to his clear convictions of the fatal consequences of the change of course against Russia, frankly declaring to the Fuehrer that he could not go along with him on this course and therefore asking him to accept his resignation. The General who commands a division has to *take* orders in war; the responsibility of the chief of a service branch is a higher one!

Grand Admiral Raeder stood in opposition to his entire staff on the question as to whether or not the campaign against Russia was one of urgent necessity. On June 14, 1941, Hitler called a conference of the officers in high command and their leading assistants, and in a speech of an hour and a half explained his intentions and the reasons which motivated his decision. This exposition was so convincing and so conclusive that after the address no member of the Naval Staff present had any further doubt of the unqualified necessity of the campaign as a preventive war.

Despite all representations to the contrary, Adolf Hitler was convinced in 1941 that the German campaign against Russia must be undertaken to anticipate an impending Soviet attack, and he attempted to prove his case to the German people and the press. When the German army suffered the first reverses in Russia at the beginning of winter and the colossal preparedness of the Bolsheviks became apparent, it appeared in fact as if Germany had seized the initiative just in time, at the twelfth hour, to save occidental Europe from destruction! What is the score here? To what extent will history recognize this thesis as justified? With this question we touch in conclusion the vital problem in the relations between Germany and Soviet Russia.

⁶ As, for instance, Generals Beck and von Fritsch and Ambassador von Hassel.

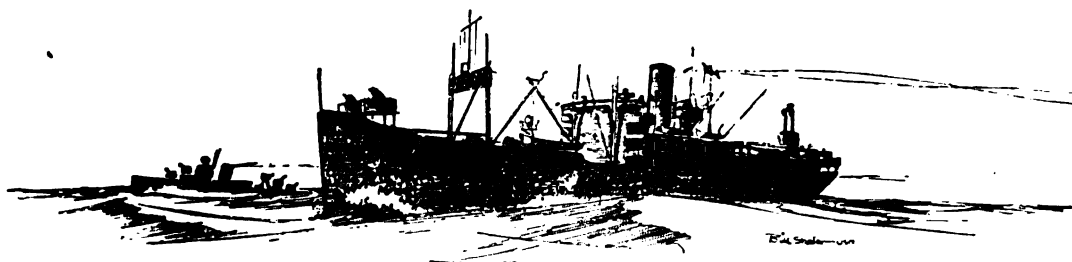
German and foreign observers who have had the opportunity to form an opinion of the character of Stalin all agree that he is a man of great ability, a cool, sober calculator who understands the art of biding his time and who is not disposed to embark on adventures of war endangering the Soviet regime and his own position. Herein lay *and still lies* the counter-weight to the aims of the Comintern—world revolution.

It is a historical fact that Russia had no intention of attacking Germany in the spring of 1941. At that time the Soviet government was ruled exclusively by the fear that the German forces would carry the war into its land. After the astounding German successes of the previous campaigns of the war, Germany's fighting strength was rated so high that it seemed more than doubtful that the Red Army could stand up to it. The political attitude which the Soviet government showed during and after the German advance into the Balkans indicates that they were then unaware of the potential power latent in their armed forces. In point of fact, this power was brought out by the war; it was the war which forged the Soviet armed forces into the powerful instrument that was able to drive the Germans from their land and then to carry the war into enemy territory. Moreover, Soviet Russia had to digest the large territories which she had gobbled up in 1939–1940. Therefore she needed peace. Thus the thesis that the German attack in spring, 1941, was necessary as a preventive war collapses.

On the other hand there can be no doubt that had the further course of the war against the western powers developed unfavorably for Germany, and the latter faced likely defeat, Stalin would have ruthlessly seized the opportunity to get his share of the loot and to expand the realm of Bolshevism. If this thesis for 1941 requires further verification,

one need only point to the conduct of the Soviet government in the post-war years. Even the most bitter foe of the Nazi regime will no longer disagree that in this regard and from a long-range point of view Adolf Hitler appreciated the situation correctly. However, in the situation in which Germany then found herself, the way to meet this danger was not the attack on Russia but the continuation of the war in its former scope. With her rear secured in the east, Germany should have laid her course to make herself so strong that Russia would have lost any desire to attack. This way was indicated by the policy of Germany initiated in Moscow in 1939. But Adolf Hitler chose the other way—the way which led Germany from the highest peak of power in her history in a steep descent to the lowest depth.

Now, after the collapse of his country, it is particularly painful to a German to realize what a superior position the German Reich then occupied when she was at the peak of her power with respect to Soviet Russia—how she could have utilized her strong position, and what possibilities for the German future were let slip at that time. These are so apparent that it is unnecessary to detail them here. Within the scope of this article it is important to establish that the inclusion of the Balkans in the German sphere of power had sufficed to provide that measure of security relative to Russia which Grand Admiral Raeder had hoped to attain with a German advance to Suez and Asia Minor. Yet, what is much more painful—and not just for a German—is the fact that the dam which was erected in 1941 under the leadership of the German Reich against the spread of Bolshevik imperialism, and which appeared to stand so firm, has in the meantime been broken and irrevocably washed away by the waves of the great war as it swept over central Europe.



SEE YOUR NAVY LAWYER FIRST

By LIEUTENANT COMMANDER BURDICK H. BRITTIN, *U. S. Navy*

DURING the war, the destroyer I was on had several opportunities to drop its anchor in numerous Pacific atolls. During each visitation, as the opportunity presented itself, our Skipper permitted swimming from the fantail or the beach. At the end of each swimming period the members of the party would line up in front of the doctor and get their ears swabbed out with a medicinal solution to prevent later infection from impurities in the water. No one intentionally avoided this little ritual simply because of the obvious benefit derived from it, compared to the pain and trouble occasioned by the potential ear infection. Like many other aspects of medical treatment the doctor applied, in simple form, preventive medicine rather than corrective medicine after the disease had taken its toll.

The theory of anticipating or preventing a serious physical condition covers the entire scope of progressive medical research. The apex desired is to thwart all disease before the damage is done rather than to rectify the situation when it has reached the injurious stage. The words "preventive medicine" connote the splendid work that has been and is being done in the medical world. The average Navy man knows this, appreciates it, and consequently takes full advantage of the preventive medicine offered by the ship's doctor. With this in view, it is an anomalous situation to find that another form of preventive medicine is seldom used. For want of a better term I like to refer to this other form as legal preventive medicine.

Similar to medicine, the law can be divided into two broad categories:—the static preventive law upon which an individual's rights and duties rest, and corrective law which becomes activated when individual rights or duties have been interfered with. A striking similarity is noted between medicine and law in both the preventive and corrective phases of treatment to the patient. The corrective side of medi-

cine or law is usually painful, burdensome, expensive, and rarely leaves the individual in as good shape as he was before the difficulty arose. Conversely, the preventive facet of law or medicine is usually painless, easily administered, inexpensive, and invariably leaves the individual with mind, body and pocketbook intact. Yes, I am sure we all agree that legal preventive medicine is a far superior means of treatment when compared to its companion, legal corrective medicine, but look what usually happens.

Lieutenant X reported to ComSix for his two-year tour of shore duty. He found that he was unable to rent an apartment for his family, so he turned to the only other alternative and entered into a contract to buy a home from a local realtor. The contract looked good to him, and it was not until later that he learned that by signing the contract he had made himself liable to lose thousands of dollars unless he took lengthy and expensive action in a civil suit against the realtor. With contract in hand, Lieutenant X dashed down to the legal officer at ComSix who substantiated the fact that the only remedy available was an action in court, i.e., the arduous corrective medicine. Lieutenant X had simply forgotten to apply the thesis of preventive medicine *before* he had signed the contract; a visit to his legal officer prior to signing probably would have obviated his present difficulty.

Roe, J., YN1, was ordered to duty in Nor-

A GRADUATE of Union College, Lieutenant Commander Brittin was commissioned in the Naval Reserve and assigned to active duty in October, 1940. On December 7, 1941, he was one of the four officers who brought the destroyer *Aylwin* out of the Pearl Harbor holocaust. From 1946 to 1949 he was on duty in the Judge Advocate General's Office in the Navy Department, and at present he is aide to the Chief of the U. S. Naval Mission to Turkey. He holds a degree in law.

folk and set up house-keeping there with his wife. When the personal property tax of the state of Virginia became due he paid it just like his civilian neighbors. What he did not know was that he had made an unnecessary tax payment, for the provisions of the Soldiers and Sailors Relief Act excused him from that type of state tax. As in the previous example a little preventive medicine in the form of a visit to his legal officer *prior* to paying the tax would have saved him some money.

Ensign Charlie finished his flight training and received orders to proceed to an aircraft carrier as a member of its fighter squadron. Knowing that he would be separated from his wife for a long period of time and that the duty was hazardous, he deemed it wise to execute both a power of attorney for his wife and a will. His visit to an attorney downtown accomplished both; a week later he paid the attorney's fee for drawing up the instruments—\$45.00. Some of the other officers in the squadron had done the same thing, with the exception that they had gone to see their legal assistance officer first. Inasmuch as it is part of the duty of the legal officer to prepare many types of legal documents, including wills and powers of attorney, the officers had it done by him and saved the \$45.00 Ensign Charlie so glibly parted with.

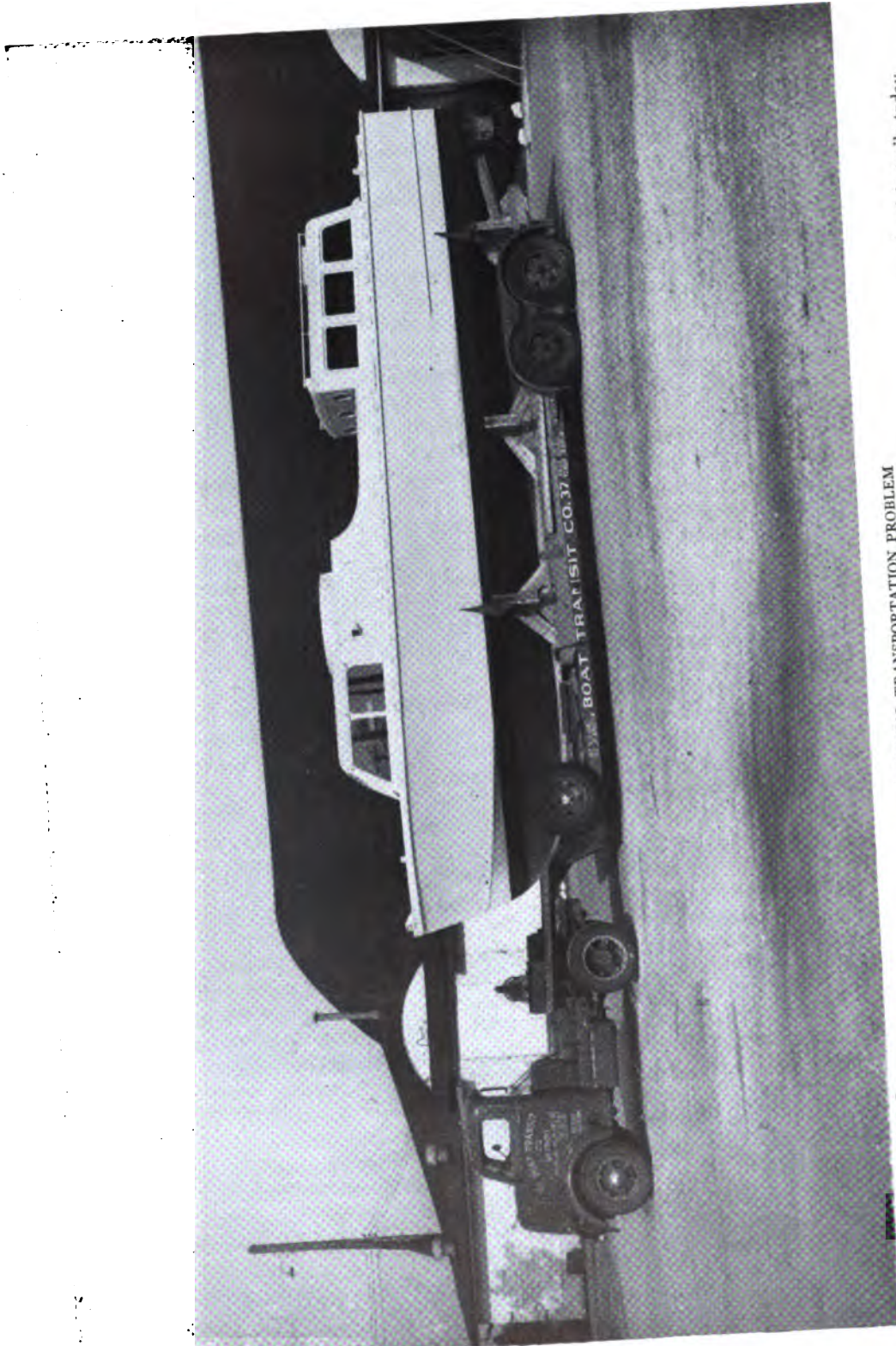
Many more examples pointing to the analogy of legal preventive medicine could be cited; the reader undoubtedly knows some, or perhaps has even experienced a taste of legal corrective medicine himself when the opportunity to prevent the difficulty has passed. I think it can be said, as a general proposition, that naval personnel fail to take full advantage of legal advice at the most appropriate time, i.e., before they find themselves in a jam. Legal assistance officers are presented with case after case which have already reached a point where preventive medicine can no longer be applied.

At the present time there are approximately 300 legal assistance officers throughout the naval establishment. They are situated so as to be available to the great majority of active duty personnel. Since the establishment of legal assistance offices by the Secretary of the Navy in 1943, it is estimated that there have been over a million and a

half cases presented by service personnel and their dependents. It is not possible to show how many of these cases had already reached the point beyond which legal preventive medicine could be of any help. It is known that many of them had progressed to the stage where the only remedy was a court action with its inherent anxiety and expense. How many of these cases could have been obviated by timely application to the legal doctor is a moot question and of no concern here; it is sufficient to state that an unknown number of them fall within the category of being too late with too much against them.

Perhaps an explanation for the common failure to make timely application for legal advice stems from the curious train of thought that the primary function of a lawyer is to get one out of trouble. Undoubtedly this concept has been nurtured and fostered by the moving picture, newspaper and radio drama interests simply because there is "box office" in the dramatic trial sequences of modern day thrillers where the lawyer, on bended knee, pleads with the judge and jury to let Jake the Eel go free. Thus the public sees and hears the lawyer applying corrective medicine. Conversely, there is little to interest the public in a stage setting of a client asking his lawyer for advice as to how to get his landlord to provide more heat for his apartment. It follows that the public tends to forget the tremendous amount of good the lawyer can and does do in the preventive stage. This, however, represents the lawyer at work at the most advantageous and appropriate time, i.e., keeping the individual out of trouble rather than trying to get him out of the mess once he is in it. He can prevent the misfortune of binding oneself to an installment buying plan, with excessive interest rates, if he sees the contract before it is signed; conversely, if the contract is signed on the dotted line and then brought to him, there is little that he can do.

So many of our relations with other people have a legal facet to them that I cannot emphasize too strongly the desirability of making that quick trip to the legal officer for a brief treatment in preventive medicine. Before you make the jump he can assist you in making a happier landing—be it in contract, tax, will, property, or domestic relations.



MEETING A SPECIAL TRANSPORTATION PROBLEM

Courtesy George H. Grob & Son

Much handling, and expense, can be avoided by meeting special problems with special solutions. The trailer-truck is employed satisfactorily today by many small boat builders for deliveries, within the legal limitations set by state highway commissions.

NAVY TRANSPORTATION LOGISTICS

By CAPTAIN F. CLIFTON TOAL, (SC) *U. S. Naval Reserve (Inactive)*

INTRODUCTION

THE VERY magnitude of transportation in this war amazes us as we view it in retrospect. No war was ever before fought at such great distances. Never before were such incredible numbers of men and such stupendous quantities of material transported. The solution of the logistics involved no less a problem than those encountered in establishing sound policies of tactics and strategy.”*

After World War II had broken out in Europe the world witnessed the frantic efforts of the United States to arm itself; it saw the mushrooming of war plants and military establishments; it saw the building of ships with incredible rapidity. From these facilities and into these ships in the years that followed, it saw seemingly endless quantities of men and materials moved in an ever increasing flood to feed the maw of war. From procurement to combat, transportation constituted vital links in the chain of logistics that made victory possible.

Unlike some strategic war materials, transportation cannot be stockpiled. The effect of any disruption in transportation is dire and immediate. This has been demonstrated in peace as well as in war. Planning in times of peace for the needs of transportation in war is therefore of the utmost importance.

The purpose of this article is to focus attention on this essential phase of logistics; to review briefly the scope, magnitude, and history of transportation in World War II; to consider transportation requirements and procedures of individual branches of the national military establishment—particularly in the light of unification of the services; to explore and recommend means by which the Navy, in time of war, may assure itself of transportation effectively responsive to its operational requirements.

* From Foreword, *Civilian War Transport*, Government Printing Office, 1948.

TRANSPORTATION OF THINGS

The history of the transportation of Navy property during World War II is the story of how the generators from Pittsfield, the flour from Minneapolis, the oil from Texas, the canvas from Georgia, the engines from Detroit, the clothing from Brooklyn, the radar from Cincinnati, aviation material from Philadelphia, the paint from Mare Island, the lumber from Oregon, the landing craft from Muskegon, ammunition from Indiana, Alabama, Nevada, the grapefruit from Florida, the bacon and eggs from Iowa, the peaches from California, the beer from Milwaukee, and the carbon paper from Rochester, were moved to the thousands of Navy ships and advance bases all over the world, not to mention the transportation of things to and from the more than 700 war-time Navy shore establishments within the continental limits of the United States.

At the peak of World War II there were over 12,000 such shipments a day. They ranged in size from individual compass needles to ocean going tugs. Some were worth much less than the cost of transportation, others were so valuable as to give the carrier's insurance agent nightmares. Some were as commonplace as inkwells, others were so secret that they required a Marine guard armed to the teeth to stand watch over every foot of their journey.

In many cases the risk to the carrier was no greater than in handling pig iron, but in the case of others ten pounds carelessly

A GRADUATE of George Washington University who has taken intensive post-graduate courses in transportation at Harvard Business School, Captain Toal has had more than 25 years of experience in the transportation field. Officer-in-Charge of a major Navy transportation unit during the late war, he is at present a member of the Railroad Committee of the NSRB and General Industrial Agent of the Southern Railway.



Official U. S. Navy Photograph

NEEDED IN A HURRY

When a vital item of ship machinery or other urgent heavy equipment must be given emergency delivery in time of war, air transport frequently saves in time much more than enough to justify the high cost-per-pound of such shipping.

handled would have wrecked a ship or a whole train. Many shipments could be as openly addressed as "Navy Yard, Brooklyn, New York," in the case of others a coded address might indicate a supersecret base under the very nose of Tojo. Urgency ranged from stock items that would not be needed for a year to such items as the one that kept a capital ship immobilized in the very heart of the Pacific war zone until its arrival.

Shipments moved by freight, by express, by mail, by ship, by motor truck, by air, by hand and by various combinations of these carriers.

The problems involved in the transportation of things and of people differ in several respects. Human beings at least come in fairly uniform dimensions, however much they may differ otherwise. That is much more than can be said for things, and makes the planning for the transportation of people simpler than for battleship propellers and such like. But the greatest difference lies in the fact that things are deaf and inarticulate.

The thousands of items necessary to support the mighty U. S. fleets in World War II could not, like passengers, speak out for themselves if they were sidetracked, delayed or placed aboard the wrong carrier. They could not search and fight for taxis to make close connections. It was not enough for a procurement or requisitioning agency, or a logistics planning staff simply to request that a vital item be moved from here to there and to arrive at a specified time. Someone who knew transportation had to perform the function of a "travel agency" and had to arrange for the journeys of these hundreds of thousands of items.

There is a name and a well established place for this job in American industry. Its name is "Traffic Management." It is recognized in the transportation world as a highly specialized profession. It takes the better part of a lifetime to become an expert in this profession and to get on terms of familiarity with such mysteries as the tens of thousands of freight tariffs governing the charges and

movements of the nation's commerce, comparative schedules, switching and other terminal services, general average, dunnage, pick up and delivery rules and regulations, transit privileges, clearances, accessorial services and charges, cargo stowage and loading practices, export declarations, embargoes, weight and measurement tons, sidetrack agreements, routing restrictions, carrier and port capacity, cargo banks, packaging requirements for various types of transportation, weight and dimension restrictions, air waybills, freight forwarder service, freight rate adjustment procedures, etc., etc. Long experience with these and many other factors in the business of transportation constitute the base for the informed judgment of the qualified traffic manager. The average person in the United States takes transportation for granted. Accustomed to it in time of peace, he assumes its unrestricted availability and unimpaired quality in time of war. Indeed, he finds it difficult to believe that there is no fast and easy way to acquire the knowledge and understanding upon which sound judgment and hence sound decisions must rest.

The traffic management function may be defined as the determination of the means of transportation to be used, and the dissemination of necessary instructions to move a thing or a person from one place to another in conformity with considerations of cost, time, security, and other requirements. It must be based upon knowledge of, and regard for, aggregate transportation capacity available and on the requirements of other users of transportation. To be effective it must be exercised on a comprehensive scale and can leave no step to chance. It includes the important responsibility of buying or utilizing the most economical form of transportation available consistent with whatever requirement as to special handling, urgency, or security may be imposed. It goes without saying that in times of peace economy is of paramount importance, but the urgencies of war often make cost a secondary consideration. Centralized control by no means precludes decentralized administration, contrary to statements that are frequently heard.

PRINCIPAL WARTIME CARRIERS

A carrier may be a commercial civilian organization, a strictly military organization, or an indistinguishable combination of the two, such as the War Shipping Administration during World War II.

By long odds the most important domestic carrier during World War II was the American railroad system, which handled well over 90% of the military traffic. Other important land carriers were the commercial motor carriers and pipe lines. The military services operated many motor vehicles on their own—mostly for local service, occasionally for over-the-road traffic.

A very considerable domestic tonnage was carried by the shipping on the Great Lakes and to a smaller extent by craft on the inland waterways. Overseas and coastal water transportation was provided by WSA vessels generally under allocation to the Army or Navy, foreign flag vessels, principally British, vessels of the Army Transport Service and of the much smaller Naval Transportation Service. In forward and advance base areas amphibious and other local commands provided much of the water-borne carrier service.

The principal air carriers, domestic and foreign, were the ATC (Air Transport Command) and NATS (Naval Air Transport Service). Commercial air lines provided considerable airborne capacity particularly in the early stages of the war before ATC and NATS became substantial organizations. In combat areas other military air commands generally took over and filled air transport needs. Commercial air carriers and their personnel under government contract provided much of the carrier capacity of ATC and some of NATS.

WARTIME NATIONAL TRANSPORTATION ORGANIZATIONS, CIVILIAN AND MILITARY

ODT (Office of Defense Transportation). Created by executive order, ODT's function was: "to assure maximum utilization of the domestic transportation facilities of the nation for the successful prosecution of the war."

Because the Army and Navy expressed a



Official U. S. Navy Photograph

THIS IS HOW TO DO IT

World War II proved that the carrier is versatile almost beyond belief. This flight-deck load of trucks illustrates how a qualified Traffic Manager may meet his constant problem of how best to meet a particular transportation need.

desire for it, and because they proved able to avoid congestion of their own facilities and to keep their aggregate traffic volume within the capacity of the national transportation system, ODT saw fit to delegate to the Army and Navy much of ODT's authority in the management and control of overseas traffic.

WSA. The War Shipping Administration nominally possessed virtually supreme authority in the field of wartime ocean shipping. An Executive Order of December 8, 1942, directed that it allocate to the Army and Navy, for loading by them, or for their exclusive use, only such vessels as were required for combat loading in special task or assault forces and such vessels as could be truly classified as fleet auxiliaries. Had this directive been given full effect, or had WSA exercised all of the vast authority given it

under the Executive Order, Army and Navy merchant shipping functions would have been greatly reduced.

In practice, WSA allocated sufficient vessels (supplementing those under direct Army or Navy ownership or control) to the Army and Navy to make it possible for each service to load and control the movement of the larger part of its own ocean shipping. Many such allocations were relatively long term bare boat charters, others were single voyage allocations. Actually the Army and Navy operated an estimated 50% of the nation's wartime merchant type tonnage. WSA nevertheless remained an extremely important agency in the field of wartime ocean shipping.

AAR (Association of American Railroads). This nation-wide Association of American Railroads is of importance in this discussion



Official U. S. Navy Photograph

AND THIS IS HOW *NOT* TO DO IT

This view of an unloading dump on Guadalcanal was taken on December 17, 1943. Long before that time, properly trained and indoctrinated personnel should have been able to prevent such hurrah's nests.

because under it was established a subsidiary unit known as the Military Transportation Section, whose primary mission was to receive and to take action on all manner of requests, special and routine, from the traffic control units of the Army and Navy. This unit was housed with the War Department in Washington; a sub-unit in the latter months of the war was established in the office of the Navy District Property Transportation Office in San Francisco. Such requests as tracers, diversions, special train service orders, troop movements, and the like were all channeled through the Military Transportation Section, which executed them for all railroads which might be involved. This organization was of the greatest importance and value to the military service. It enabled them to deal to a large extent

with the American railroads as an integrated system rather than with hundreds of individual carriers. Similarly other subsidiary units of the AAR enabled the armed services to deal with the railroads as a unit in the matter of rate adjustments, Section 22 reduced rate quotations, and the like.

THE NEED FOR CENTRALIZED TRAFFIC CONTROL

The need for centralized traffic management or control became apparent within a matter of days after the Japanese attack on Pearl Harbor. The President of the Association of American Railroads addressed a joint letter to the Chief of Staff of the Army and to the Chief of Naval Operations, pointing out that individual railroads had received, since the outbreak of war, many requests

for special service from a great variety of military personnel; that some of these requests were reasonable and some were not; that each request was represented to be the "most important"; that some were completely contradictory to others; that in some cases compliance with one precluded compliance with others; and that the net result of blind compliance would be wasteful and inefficient utilization of limited and vital carrier capacity. The request was made that the Army and Navy each designate one office or officer through whom all requests for special railroad service would be channeled, this office to be by-passed only in the direst emergency.

This request revived memories of the virtual breakdown of railroad transportation in World War I, particularly in the port areas where failure to coordinate the flow of traffic into the ports with the capacity to unload, store, and/or lift resulted in miles of loaded freight cars backed up behind the nation's ports.

The fact that the railroads found it necessary to make such an appeal was itself evidence of lack of appreciation among the higher echelons of the need for effective traffic control. Even less clear was the understanding of just what mechanism and organization would be required to bring about such effective control and just how such traffic control should mesh in with other logistic functions of the service. Under the circumstances the military heads of the two services had little choice but to designate those units in each service which had the principal peace time contacts with the railroads. These were the Traffic Control Division of the Army's Quartermaster Corps and the Transportation Division of the Navy's Bureau of Supplies and Accounts.

NAVY TRANSPORTATION UNITS

Within the Navy itself there were eight wartime transportation organizations:

1. BuPers*—traffic control—personnel
2. BuSandA*—traffic control—property
3. NTS—ship requirements; operation NTS ships in the Atlantic
4. CNO—OP-O5P—Tanker Control

* So called Certification-Disbursing functions were under separate administrative control in S&A.

5. NATS—Operation aircraft in passenger and freight service
6. Marine Corps—traffic control—personnel and freight transportation to port of loading
7. Coast Guard—traffic control—personnel and freight transportation
8. EXOS—Transportation Branch—Motor transportation (Navy owned equipment) procurement, maintenance, local passenger transportation operations

This transportation Topsy functioned in spite of an organizational setup which no one could logically defend. It worked because the operating heads of the various units knew that it must be made to work. The coordination and integration of related functions which should have been provided by a competent single directing head, with real authority, were in part achieved through the willingness of those in charge of these various units to cooperate. The great bond was wartime urgency.

What were some of the wartime difficulties and disabilities inherent in this hodgepodge of independent units?

1. The multiplicity of organizations resulted in an overlap in the scope and authority which each organization claimed for itself based largely on its own interpretation of its officially assigned functions. The multiplicity of organizations and the vagueness of the boundary lines between them provided fertile fields for the individuals whose interest lay mainly in "empire building." The evils springing from the hydra-headed transportation organization in the Navy Department were all reflected in the field offices. They were in fact intensified.

2. Liaison with transportation organizations outside the Navy was thereby rendered complicated and confused.

3. Split cognizance among various bureaus and offices—partly because of "staff"- "line" distinctions—complicated the assignment of technically qualified transportation personnel to billets of functionally sound authority and responsibility.

4. In a field as fast and fluid as transportation, it is important that policy making and operating direction stem from the same source. Policy making moreover involves professional know-how. This was lacking in the higher echelons of authority. In the ab-

sence of clear cut policies, made at the top, the decisions of the various traffic control organizations and the practices of the carriers themselves came necessarily to be accepted as policies. The mere naming of a regular line officer as Assistant Chief of Naval Operations for Transportation was not effective. Lack of professional experience, lack of skilled and experienced officers on his staff, lack of direct authority and control over the various organizations listed, combined to make effective policy direction impossible.

5. Those in immediate charge of individual units frequently did not have ready access to needed records and data available in other units. This inevitably meant reduced efficiency and economy. The physical as well as the jurisdictional separation of various units militated against the economical utilization of manpower, facilities and money.

6. Transportation in the forward areas suffered particularly from the lack of professionally trained transportation personnel.

7. With the end of hostilities the transportation specialists in the Naval Reserve could see little prospect of applying their professional experience in the postwar Navy. As a result practically none of them applied for transfer to the regular Navy. As a result the Navy is at the moment little if any better prepared to cope with the transportation problems of the next emergency that it was in 1941.

NAVY DEPARTMENT STUDY IN 1945

In 1945 a Navy committee was formed, comprised of officers from transportation units in BuPers, BuSanda and CNO (NTS). This committee was directed to examine and study the organizations, methods, and procedures involved in the transportation of Navy personnel and property with a view to determining its efficiency and adequacy and to submit appropriate recommendations to the Office of the Chief of Naval Operations. Among this *ad hoc* committee's recommendations were the following:

No change to be made for the duration of the war.

Under postwar reorganization: all traffic management functions (involving air, sea, highway, rail, inland waterway) can best be performed if assigned to a single agency.

Carrier or operating functions can best be accomplished if assigned to separate operating units (air transport, merchant type shipping, motor carrier, etc.).

That a specialist officer classification be established to provide highly trained and specialized personnel needed for traffic management functions. (It was hoped that this would encourage qualified Reserve Officers to remain in the Naval service.)

That further study be given to the personnel requirements of carrier activities.

That all measures to increase an active reserve corps in the transportation field should be undertaken, with senior reserves on inactive duty in the shipping industry used periodically as a board of transportation consultants.

Personnel for military carrier organizations is important. Happily, it appears that the Navy will always have officers and men trained for the job and capable of operating its ships, merchant type and otherwise, and the same appears to be the case with its air transportation vehicles. Such skills are to a large extent a product of basic Navy training. Not so, in the case of traffic management—hence the emphasis on this point in the findings of the 1945 committee.

While the committee did not specifically so recommend, there was agreement among most of its members that both the traffic management and Navy carrier units should report directly to a common superior who would be the Navy's transportation "boss." That in any event is the view of this writer.

WAR DEPARTMENT TRANSPORTATION DEVELOPMENTS

The Army saw the need, and attempted extensive reorganization of its transportation system during the war. Its principal pre-war transportation control unit had been in the Quartermaster Corps, which included its alert and substantial Army Transport Service, operator of hundreds of merchant type ships. This and other Army units were merged into a separate Army Transportation Corps in 1942. Nominally this Transportation Corps was the "traffic manager" of the Army. Actually its wartime transportation control proved something less than complete.

The important point is that during and since the war the Army has seen fit steadily to increase the authority, functions, personnel, and prestige of its Transportation

Corps. The Transportation Corps has taken over maintenance and operation of Army motor vehicles, Army railroad battalions, and ports of embarkation. It will be recalled that when the Federal Government recently took possession of the railroads the Army Transportation Corps was designated to operate them. Its traffic control functions extended to both personnel and property. To what extent it will exercise traffic control functions for the Army's traffic on MATS (Military Air Transport Service) remains to be seen—as also remains to be seen in the case of the Navy.

The Army has actively recruited and trained specialized transportation personnel. Its so called "affiliation program" with industry, for developing and maintaining a large reserve of trained transportation specialists from civilian life, is being aggressively pursued. The following brief excerpts from a 1948 address by the Assistant Secretary of the Army are indicative:

"The Transportation Corps, by whatever name it may be known, has a permanent place in the military establishment. . . . Without doubt, a great many of the transportation problems of World War II—and our failure to solve them quickly—grew out of faulty organization. . . . There were duplicate Army and Navy transports, air transport systems, inland transportation divisions, and other such installations, equipment and operations."

TRANSPORTATION IN THE FUTURE

No one can make more than an educated guess as to the position of transportation in the next emergency. The writer ventures the following:

1. The capacity of the nation's transportation system will be strained even more than during World War II. This strain will be greatly aggravated if enemy action results in physical damage to our continental transportation facilities.

2. There will be counterparts of ODT and WSA, with substantially similar functions, and both may be expected to assert and exercise their functions more vigorously than in World War II.

3. There will be widespread agitation for "unified" functions.

4. The Army, possessing by far the most comprehensive and extensive military trans-

portation organization and reserve, may well contend that it is in position to perform the function of Traffic Manager for all branches of the military services. Unified traffic control will be represented as in keeping with the ideal and purpose of service unification.

CONCLUSIONS

In planning an operation the ideal, from the standpoint of the military planner, is absolute control over all phases of logistic support. But with modern war becoming more and more a contest of technical skill and industrial might, traditional military principles have had to be adapted to changing conditions. In World War II the major portion of research, production, and distribution became the responsibility of civilians, either in or outside of the services, rather than of professional soldiers, sailors, and airmen. This trend will certainly not be reversed in the future.

The brief review earlier in this article of wartime carriers and other transportation agencies should make it clear that the armed services cannot in the next emergency, individually or collectively, take over the country's transportation business or exercise complete control over it. While each branch of the national military establishment must of necessity provide some of its own carrier service as an integral part of military operations in combat areas, the largest part of transportation in time of war must be provided by men not in uniform. Mergers of military carrier units will of course be effected. Witness the recent merger of the Air Transport Command and Naval Air Transport Service into the Military Air Transport Service, whose mission it is to provide major scheduled air lift for all of the armed services.

War plans prior to World War II called for the taking over and operation by the Navy in time of war of the Army Transport Service. When, after Pearl Harbor the Army made the gesture of offering to turn its large merchant fleet over to the Navy, the Navy had to confess that it was not prepared to man and to operate it. When, later, the Navy indicated that it was prepared to begin to take over this responsibility, the Army said, "No, thank you." In passing, it may be observed that the Army Transport

ce, the water branch, was the strongest of the Army's Transportation Corps. At peak it operated 1,756 vessels manned by 10,000 seamen; currently it operates 353 cargo and passenger vessels. The Army has fastly contended that operation of its transport was essential to the effectiveness of its forces. (In 1948 the Secretary of Defense by directive transferred the Transport Service to the Navy.)

The fact that no branch of the military transportation will ever have absolute control over all of the carrier agencies serving it does not diminish the importance of its transportation problems. Every branch of the armed services must be equipped with transportation measuring up to its operational needs. This calls for planning in two directions. Transportation requirements must be planned to meet estimated operational needs, and strategic and tactical military plans must be made with regard to available or prospective transportation capacities.

Within the field of its military mission the Navy must not only plan its transportation, but it must also have control over the execution of those plans. Only by including in its own organization personnel that is experienced and competent in traffic management can the Navy be certain that transportation will be responsive to its operational needs. This phase of logistic support is closely and immediately related to combat commitments and operations as to make it unthinkable that any military service would contemplate the exclusion of this control from its chain of command.

The definition of traffic management is being repeated at this point in order to make quite clear what is and what is not included under the term. Traffic management is the art of determining the means of transporting people and things from place to place and of disseminating appropriate instructions to bring this about in such a way as to meet the considerations of time, security, and other requirements that may be involved. It will be noted that it has nothing to do with providing or operating carrier facilities. The merger of such facilities whether on the sea, in the air, or on land does not therefore alter the logic of the argument for Navy control of Navy

traffic. It will not alter the principle that the carrier cannot be allowed to make arbitrary rules as to what to carry and in what priority. The carrier must accept the shipments offered within the limits of its capacity and provided safety precautions are not violated.

The argument has been advanced that with joint procurement for the armed services joint traffic control must follow because traffic management is a link in the chain of procurement. It is true that transportation is the working partner of procurement. There can be no question that traffic control personnel should be thoroughly conversant with procurement procedures and, equally, that procurement agencies should carefully observe the shipping procedures developed by traffic management.

Navy procurement was scattered among many offices during World War II. The Navy's reasonably well centralized freight traffic control more than once provided the means of achieving some measure of stock and inventory control that proved baffling when attacked through stock and procurement channels. To the extent that procurement becomes centralized and unified it will present an opportunity for increased efficiency, economy, and standardization in traffic control. If traffic management is the working partner of procurement, it bears repeating that it is even more the handmaiden of Operations. So long as each service is to be responsible for its own operations, the planning and direction of transportation logistics is a function which it cannot safely allow to be excluded from its own chain of command.

If those responsible for the Navy's logistic planning concur in the view that the traffic management function is one which the Navy must retain and be prepared to exercise efficiently, then some action towards setting the Navy's house in order is long overdue. Early consideration and action on the *ad hoc* Committee's report of 1945 would be a good starting point. The item of specialized personnel is of particular importance. Mention has been made that strategic and tactical planning must include consideration of transportation requirements. For such planning, up to the highest level, professional traffic experience is essential. The Navy can ill afford the risk of entrusting such functions to amateurs.



Official U. S. Marine Corps Photograph

PUTTING TRAINING TO THE TEST ON GUADALCANAL

Japan's two major efforts to recapture Guadalcanal were based on seizure of Henderson Field for use of Fleet aircraft. The Jap fleet stood by waiting for the signal in vain. The Marines could not be ousted initially, or later with Army reinforcements.

MARINE CORPS TRAINING

By MAJOR JOHN L. ZIMMERMAN, *U. S. Marine Corps Reserve (Inactive)*

THE OTHER day I met an old school-mate, and we began talking of the dear dead days when the two of us being taught how to teach people. The University of Minnesota, in those days, was all out in the matter of progressive methods, and for our sins we had had to take in.

When we got to the subject of our later years, and he found out that I had been in Marine Corps, his ears pricked up. It was that the Corps had made a most favorable impression on him because of its conduct during the war, and with a professional singleness of mind he attributed the degree of skill which the outfit demonstrated to the fact that the individual members were well taught. As a professional teacher—currently a professor of education, in a position where he teaches people how to teach people how to teach—he was curious to know how we had achieved that result. Did we use modern methods of presentation? What use did we make of visual aids?

I thought then I decided that within that sphere of discourse we could not converse to profit, for we no longer spoke the same language. Modern methods? Ours were old as the wheel was invented; they were used by the father cave man who taught his son how to swing a club. Visual aids? I recalled the curtain rod that our Instructor, Moss, carried and how he used it to beat out the cadence on our heads as we dozed off—the only visual aid I saw that was worth its salt, and that was more tangible than visual.

I brushed my friend off with a few casual remarks that would not hurt his feelings, for he is a good fellow and fond of his work in his cozy little niche, and we parted with mutual expressions of the highest consideration. And for a long time after he passed out of sight, the train of thought he had evoked kept buzzing around in my mind. The matter of fact, just why was it that the

individual Marine was such a well trained fighting man?

I suggest that it was because the Marine Corps, in the years preceding the war, specifically did not surrender abjectly to the training manual—cute charts and diagrams—lots of training films theory of instruction. I suggest further that it was simply because, working through the phenomenally good noncoms who have always been Heaven's gift to a deserving outfit,* the Corps has succeeded in giving each of its recruits far more competent individual instruction, and more of it, than either of the other services has found it possible to give.

That is not to say that various aids were not known to the Corps. Indeed they were. Our own company office had a little shelf of drab, unimaginatively titled booklets, so-and-so dash something else. We thought highly of them, and so well did we guard them that none of them got dog-eared and few of them were soiled on the edges.

Also, there was that *tour de force* of question-and-answer instruction, the *Marine's Handbook*. It is a matter of amused recollection to us that this handy compendium of information was required reading (and memorizing) for every private who aspired to his first stripe. It was perhaps the most compact and frugal manual ever put between covers, as it was certainly the most stilted. According to it, one never, under any circumstances, named the parts of any weapon or equipment—one always, instead, gave the nomenclature. The reading of it brought us much joy and little profit, I'm afraid, although we read it. For we knew that sandwiched in among the unbelievably fatuous questions and answers that made up most of the text† we would find the odd item

* The United States Marine Corps, General Clifton B. Cates, Commandant.

† "What is grid north?" ANS. "The direction of grid north." *Marine's Handbook*, Major L. A. Brown. Published by the Naval Institute, edition of 1940. Page 143

A GRADUATE of the University of Minnesota, Major Zimmerman enlisted in the Marines in 1940 and was with the 6th Marines in Iceland in 1941. Commissioned a first lieutenant in 1942, he served as a language specialist with the 6th Marines during the closing phases of the Guadalcanal campaign. Invalided home with malaria, he was subsequently attached to the historical section at Marine Headquarters.

that shone upon us like the jewel in the head of a toad. Such, for instance, as the following:

"What will thoughtful men carry for use along the trail?"

ANS. "Toilet paper."*

And, of course, there were a few training films. These were shown to us in the theater at the Marine Base, generally in the afternoon immediately after chow. I recall one screen masterpiece that showed how discouraging a machine gun, in the hands of a worthy operator, could be to any threatener of our nation's integrity. We could easily tell which was the enemy, for he had his cap on backwards, and at the first burst he arose terrified from the bushes where he had been skulking and took off o'er the flowering lea in strange simian leaps.

It was all just too droll for words and some of us tittered politely. The rest of us were asleep.

Then we all went out into the open air and down onto the waste land between the Base and the bay, where Moss taught us how to hit the deck and crawl. He taught us by doing it himself and by making us do it in the stinking sandy mud. There are several men alive today, and able to sit comfortably behind a desk, simply because Moss taught them how to move around on their bellies and keep their tails down.

Right there, I think, is the crux of the matter. The film, sound and irreproachable though its concept was, nevertheless was a remote and somewhat unreal thing, in which we could not participate. Moss' lesson, which followed it, was an experience. He literally ground us into the mud until each of us could do what he was teaching us to do—even my fellow townsman Pat Pilla,

who congenitally lacked a sense of rhythm and could never keep step and who, as a result, was made a messman. (I wonder what ever became of him. The last time I saw him he was sitting in the dust on a little street in Otaki, New Zealand, playing *O Sole Mio!* on a bazooka for the delight of a crowd of small Maoris.)

Moss enjoyed our profound respect. He was a three cruise corporal, a dirty, vicious fighter, and no one played cards with him more than once. He would take off at liberty call and return, to be helped into his bunk, at four the next morning. But no matter what the night had been for him, he drove us throughout the long day like an Arab slavemaster, matching us step for step and shouting at us until his voice was a hoarse croak. There was a strange twisted integrity about him that made him drive himself even as he drove us, and made him look upon perfection as something that was almost, but not quite, good enough to pass inspection. It was not entirely facetiousness that led him to echo a remark that has come down from innumerable generations of noncoms:

"Well, that looks O K to me—it ought to tickle hell out of the Colonel."

That same integrity seems to have permeated the ranks of all the noncoms of those days. A varied, highly individualistic crew though it was, its members had in common a mute, implicit professional pride, a feeling of responsibility not only toward themselves—although they were touchy as Spanish grandees in that respect—but for the Corps as a whole. It was this feeling that made it not only possible, but mandatory, for them to impart their skills, and with those skills the pride also, to all with whom they came into contact.

Their methods were as individual and as varied as the men themselves. Some of them set about their task with a quiet ferocity that made us listen and learn in self defense. As witness, for instance, Girard and his lecture on anti-aircraft fire.

We were sitting around in the greasewood, at the edge of the desert behind Camp Elliott, one day in December of 1940, and Gunny Girard was giving us the word on directing rifle fire at enemy planes.

* *Ibid.* Page 204.



A MAJOR MARINE CORPS TRAINING CENTER

There was something pathetic about the idea of Gunny impotent before three small words—something reminiscent of an elephant unable to do anything about a mouse—and it was that more than anything else that

made us remember, although we never saw one again, what a *cheval de frise* was.

One of Girard's coevals was a strange little man whom we called Gunny Mike, who was as unlike him in methods as he was in appearance. He was small, gnarled, and beginning to be arthritic. His dark face was a mass of scars and wrinkles, and across his jutting nose, giving that magnificent organ a rakish fore-and-aft tilt, was a broad, jagged cicatrice. Hot yellowish eyes flanked the nose like sidelights. His shoulders were not level, and his knees were always slightly bent, as though he were a mountain man, and he walked with a crab-like gait. Altogether a gnome-like man was Gunny Mike, and yet all the knobby, rough physical parts added up to something strangely upright. Boots and veterans and the younger officers stood a little straighter as they spoke to him, as though their unseen antennae quivered with the vibrations coming from his fierce, mute, spiritual erectness.

Mike taught well because he was completely in love with the things he had to explain. A weapon, to him, was an individual, a sentient thing, and he seemed to understand it as though indeed he could converse with it.

One day on board the *Biddle*, that noisome pig-iron crate whose winches waltzed along the deck and emitted steam in clouds that provided her with an adequate smoke screen as she carried us to Iceland, Mike broke out his platoon to give them the word on the 60 mm mortar. He sat on the deck in the sun, with the vicious little weapon beside him, polished and shining like a jewel. The men gathered around him.

"Now she ain't no good for big stuff, but we don't want no big stuff. That's for artillery—artillery takes care of big stuff. No, she go straight up, come straight down—like this. She fall in guy's axe pocket while he hide behind a tree. Good for machine guns. No good for big buildings, but we don't want no big buildings—artillery get mad if we wreck buildings—What's that, Boy? Huh? Can't hear, eh? Lissen louder, Boy—She's light, pick her up and carry her, like this. Don't forget, now—no good for big stuff—she work on little stuff, down in a hollow—"

As he spoke he caressed the mortar,

stroking the barrel and the stand, and when he secured the detail he remained behind, sitting in the sun. I went away with the distinct impression that the little weapon was snuggling up to him, like a puppy.

It must be clear by now that I am inclined to support the direct method school of thought, to lapse for a moment into educationist jargon. It is not that I have anything against manuals or books. Far from it. Manuals are indispensable, if for no other reason than that they provide the chapter and the verse we must point to when we would justify, to our superiors, what we have learned. I have already pointed out how, in the Headquarters Company of the 3d Battalion, 6th Marines, we thought so highly of our little store of them that we kept them in mint condition.

It is simply that I believe that certain physical skills cannot be learned from books. When one learns a language, he does so by listening to and imitating someone who speaks the language. That is, of course, if one desires really to learn the language, and not merely to learn about it. In precisely the same way must be learned the survival skills which are basic to any military study.

A reasonable, considered respect for the written word and the recorded thought is one thing; a singleminded, cultist worship of them is quite another. In the case of the former, the written word is looked upon as it really is—a means to an end. In the case of the latter, the relationship is thrown askew, and the reading of the written word becomes the end and the desideratum.

One day in the same month of December a companion and I were assigned to one of the rifle companies of the battalion as intelligence men—as scouts, in a word. A battalion maneuver was under way which involved a rendezvous of three companies after independent movement through territory held by a hypothetical enemy. Our company, under a Captain Wagnall, was moving along a road which was flanked on each side by parallel ridges two hundred yards away. Greasewood and wild lilac covered their slopes.

Now there can be no doubt about the Captain's military ability. He was well thought of in the battalion, for he knew the

nuals practically verbatim, and a tactical problem, he could rattle out a solution by heart, including the day was warm and the hour was creeping up on us. But the further imponderable trifle the battalion commander was a stickler for appearances.

One of these considerations was the sake of appearances and speed, which kept us in close formation and without scouts or patrols. He checked me when we suggested it.

At a spot where the ridges closed and the greasewood was thick, he took us. The air was full of grenades—evaporated milk cans in them. They made a portentous sound as they came down, and they hurt us, and spiritually, when they hit us. Then the company hit the dirt, and I taught to do it by men like

Gunny Mike and Moss. The sergeant had never studied at the feet of the others, remained upright, surveying the dust. And as I looked up from my position in the roadside dust, I saw an old Irish face rise slowly from the greasewood. It was an old noncom, a soldier, one of the hypothetical ones as I watched him he raised an eyebrow and let fly one more tin can at the sergeant's unsuspecting back.

Just then the bandy-legged little battalion executive officer came chop-chop down the road.

"You have suffered 60 per cent casualties, and your company is no longer a combat unit," he said. "And the colonel would like to see you at once," he added.

Hepburn looked at me and I at him, and then we grinned at each other, lying there in the fragrant desert dust.

As I re-read what I have written, the disturbing thought comes to me that I have let nostalgia lead me by the nose and that perhaps they are right who equate *newer* with *better* in matters of methods as in matters of weapons. Perhaps I have been a little too busy about the desert and the dust and the greasewood.

Perhaps, but I don't quite believe it. For us, those things were our ivied walls and mullioned windows and hushed, mellow lighted libraries. For us, the bitter, salty monosyllables of an exasperated gunnery sergeant were as truly pronouncements *ex cathedra* as anything that ever emerged from a professorial gullet behind an oaken lectern. There we learned many things besides what I have enumerated above, and somewhere among the number of them lies the explanation of why there was never an *Over the Hill In October* movement in the Marine Corps, nor any *I Want to Go Home* riots at the end of the war.



NOT TO THE MAINE

Related by LIEUTENANT COMMANDER RICHARD P. HODSDON,
U. S. Naval Reserve

At the first World War we received on board our ship a group of young Ensigns who had been on the Naval Academy a year ahead of time.

When we were steaming in formation "Column of Ships," Ensign Blank was keeping the stadimeter. Every few minutes he would sing out the distance to the Captain who was standing on the bridge. After one longer than usual interval the Captain said, "What's the distance, Blank?"

Blank, and then, "Eighteen hundred yards, Sir."

Incredulous, the Captain asked, "Is that to the main?"

The Ensign laid down the stadimeter, picked up his binoculars, and carefully studied the mainmast. "No, Sir. To the *New Jersey*!"

PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS).



Official U. S. Navy Photograph

CONSTRUCTED TO HOUSE STATE, WAR, AND NAVY

The Secretary of the Navy occupied an office looking out on the central portico on the second floor of the east facade (right, above), and the Secretary of State the same relative position on the south facade (left, above).



Official U. S. Navy Photograph

THE OLD NAVY BUILDING ON SEVENTEENTH STREET

The classical structure of the old Navy Building in the foreground, resembling a college building of the late 18th and early 19th century, finds the State, War, and Navy Building growing up around it. This new building had been authorized in 1871.

STATE, WAR, AND NAVY—UNDER ONE ROOF, 1882

By DR. ROBERT GREENHALGH ALBION

THE CURRENT move of part of the Navy Department to the Pentagon Building arises from the long-recognized desire of providing easy access among departments which have many interests in common. It will bring under one roof not only the makers but also the "opposite numbers" at various operating levels in the departments of the Army, Navy, and Air Force, as well as the officials of the Department of Defense with their overall responsibilities.

It recalls a small but significant episode in 1882, when the approaching completion of the old State, War, and Navy Building, west of the White House, gave a similar opportunity for propinquity, that massive granite pile, incidentally, designed in 1871 and completed in 1888, a product of the so-called "General School of architecture." It was not generally regarded as beautiful even in its day; when William T. Sherman moved his new quarters as General of the Army, the superintendent is said to have looked proudly, "General, this building is a roof." Sherman looked around and then said, "What a pity!"

The idea embodied in bringing the three departments together was more significant, however, than these aesthetic considerations.

At the beginning of the century, State, War, and Navy, along with Treasury, had their separate buildings grouped around the White House, forming a pattern like a familiar five-spot on dice:

	Pennsylvania Avenue		
War		State	
	White House		15th St.
Navy		Treasury	

In 1882, the new building on the site of the old War and Navy Buildings at the corner of 17th Street gave the opportunity for administrative propinquity.

Strange to say, only one segment of the triangular arrangement was an object of real desire on the part of any department. At that time the Army's interests were largely centered upon Geronimo and other redskins in the West; its contacts were largely with the Interior Department, and not until after 1898 would it develop close mutual interests with State and Navy. The State Department, ever conscious of its primacy, sought to operate in an atmosphere of splendid isolation.

The Navy Department, however, had tried down through the years to develop closer relations with the State Department. Even during the Civil War, when the Army and Navy were continually staging joint operations, Secretary Welles wrote in his diary:

The Navy Department has, necessarily, greater intimacy, or connection, with the State Department than any other, for, besides international questions growing out of the blockade, our squadrons and commanders abroad come in contact with our ministers, consuls, and commercial agents, and each has intercourse with the Governments and representatives of other nations.

The State Department always had much to say about what the Navy would do; and the Navy naturally sought a voice in the determination of such policies. Rear Admiral Fiske would be voicing such views in 1914 and Admiral Stark in 1940. The Navy's

RECENTLY APPOINTED Gardner Professor of Oceanic History and Affairs at Harvard University, Dr. Albion is well known for his leadership in work in naval history conducted at Princeton University, where he has been a member of the faculty since 1922 and a professor of history since 1939. The administrative history of the U. S. Navy, 1798-1948, is being written under Dr. Albion's direction. This article is a by-product of that study.



Official U. S. Navy Photograph

SECRETARY OF THE NAVY'S OFFICE IN THE "NEW" BUILDING

In the pre-World War I period, with State, War, and Navy under one roof, this elegant office was reaching its last days of use as the Secretary of the Navy's office. During the final weeks of that war, the Navy Department moved down to Constitution Avenue.

desire for increased rapprochement, however, was not reciprocated by the State Department.

These attitudes were reflected in an amusing manner in 1882. The State Department had been occupying the South Wing for several years, while the Navy Department in 1879 had moved into the East Wing overlooking the White House and was sharing its space temporarily with the War Department, pending the completion of the North and West wings. Secretary of State Frederick T. Frelinghuysen, desiring to preserve the rarified aloofness of his department, ordered solid partitions to be erected in all the corridors to shut off any contact with War and Navy, whose Secretaries, Robert T. Lincoln and William E. Hunt, objected. Samuel Shellabarger of Ohio, chairman of the House Public Buildings Committee, took the matter

in hand, calling on the three Secretaries for their views.

Secretary Frelinghuysen voiced his department's characteristic attitude. After expressing fear that the corridors were "too liable to be converted into a promenade by persons who have no present business to transact," he continued:

The hours and rules and modes of business in this department differ from those in the other departments; and, above all, the quiet and privacy which are essential to the proper conduct of business in the Department of State, which is the confidential office of the President, would be interfered with and endangered, if a free communication was made, inviting visits from the clerks of the other departments at any and all hours of the day.

The War Department in that day had relatively little to do with State, and Secretary Lincoln, the late President's son, was

more concerned with the circulation of air than with the circulation of officials:

In the summer season, the prevailing winds are from the south, and the partition walls . . . serve to impede the admission and free circulation of air, with the effect, as I am informed, of prejudicing both the health and comfort of the clerks and other occupants and impairing their energies during that period.

The Navy Department's constant desire to have more of a hand in affairs of state was voiced by its Secretary, William E. Hunt, the "Father of the New Navy":

The proposed removal of all obstructions from the corridors of this and the adjoining buildings, so that communication from this department to others may be made through the corridors, meets with my very hearty approval. I make no doubt that it will conduce to the convenience of the officers of the department and the public in general. In my judgment it ought to be done, and at once.

The House committee recognized the State Department objections, but "in view, however, of the convenience to the officials of the several departments, as well as to members of Congress and the general public,

and in view also of the free circulation of air," it recommended that the "obstructions" be removed. This was accomplished by an act approved August 5, 1882. Upon the completion of the building in 1888, the Secretary of the Navy or the Secretary of War needed to take only 120 steps to reach the Secretary of State, while only 80 paces intervened between the Secretaries of War and Navy.

The first break in that propinquity came during the final weeks of World War I, when the Navy Department moved down to Constitution Avenue; the Secretary of War remained a close neighbor of the Secretary of State until the eve of our entrance into World War II.

Now, the old building in which State, War, and Navy were once located has been given over to other purposes; Defense, Army, Navy, and Air Force are being brought together in the Pentagon Building, while the State Department is housed alone on 21st Street and Virginia Avenue. The National Security Council and "SANAAC" provide added opportunity for the long-sought interplay.



HONORABLE ENGLISH AS SHE WAS TAUGHT

Contributed by MR. HOMER C. VOTAW

The following "examples" of our every day language are from the textbook *A Step in English Talks* which was used in Japanese Army Schools in the Philippines during the war.

I'm sorry for stepping on your feet.

How long stay here?

I like Greta Garbo.

Neither do I.

I dont drink, I dont smoke, I quit loafing. Who is that lady sitting over there?

Listen Dad (Maman, Granpa, Sister, Cousin) lend me five yen.

Your wife seems to be in D.C. (delicate condition).

Looks like it.

Shall we dance?

All right.

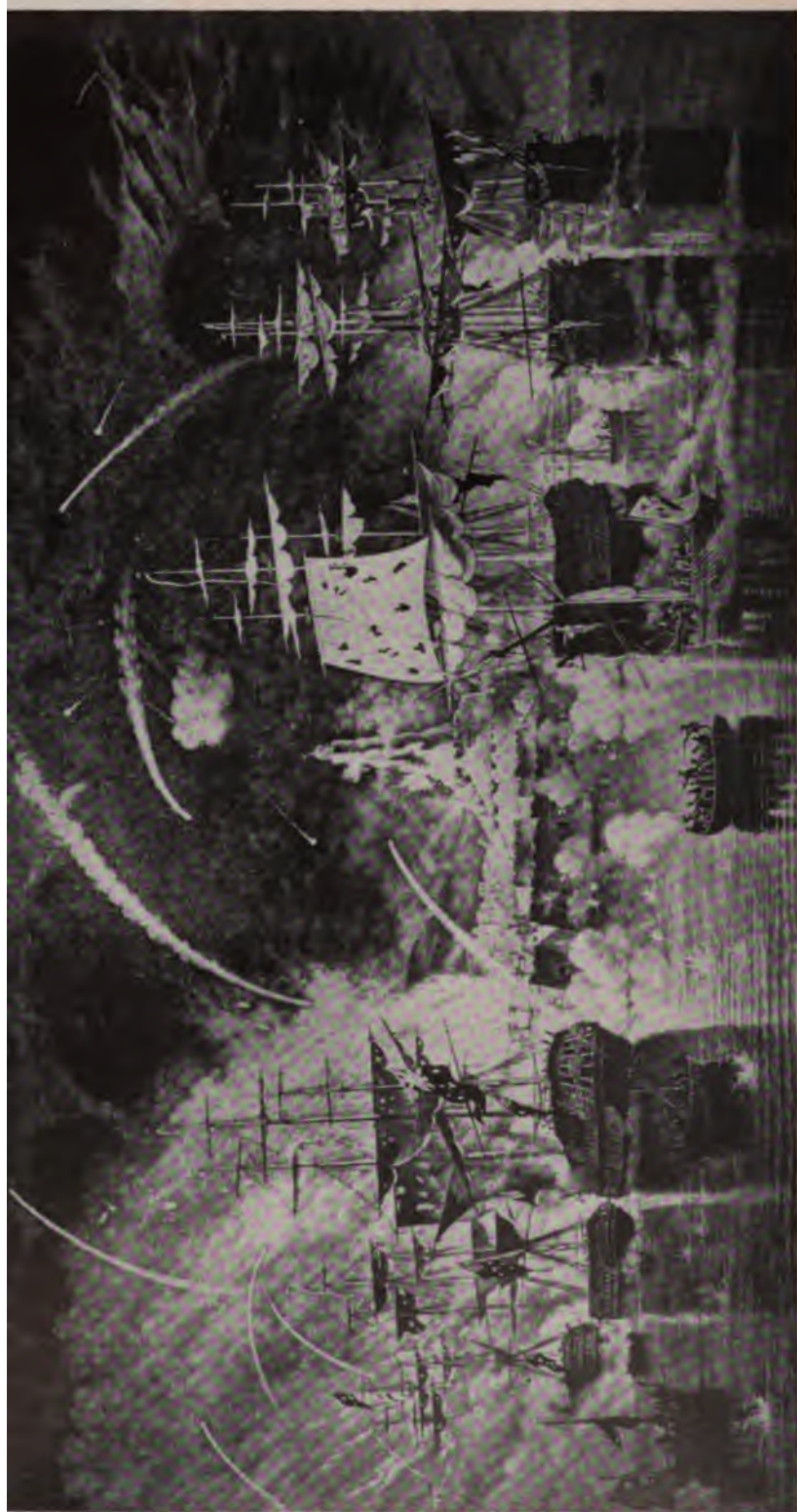
Don't do that again.

All right! All right!

Up town, up stairs, get up, a long way up, back auto up, up in air, all lighted up, up to you, bottle up! time is up, speak up, shut up!

Good morning, good night, bye-bye, ta-ta, so long, cheerio, sleep tight, come up and see me sometime, drop in again, good luck, olive oil, I'll be seeing you, Abyssinia, Ethiopia, yes, you bet your life.

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS.)



From the Macpherson Collection

THE BOMBARDMENT OF ALGIERS, 1816

From 1492 the Barbary corsairs swept the Mediterranean and the ocean approaches for over 300 years until the infant U. S. Navy first checked them. In 1816 a joint British and Dutch fleet bombarded Algiers and destroyed its fortifications and its entire fleet.

THE BARBARY CORSAIRS—A LESSON IN APPEASEMENT AND INTERNATIONAL COOPERATION

By A. E. SOKOL

WHEN our Navy entered the Mediterranean, in the Fall of 1942, and when our Army landed on the North African coast, they were not on unfamiliar territory. In fact, the United States had maintained a naval squadron in those waters from 1801 to 1818, and some naval forces up to the outbreak of the Civil War. The reason for this early show of force in these far-away regions was, of course, the predatoriness of the Barbary Corsairs, those piratical rovers of the North African States. The exploits of the American Navy in the campaigns against them, the deeds of Preble and Decatur, the long years of hard and often heartbreaking work, and the final victory are well known chapters in American naval history. But they are also some of the very few points of light in an otherwise quite gloomy record, in which the Christian nations, and above all the Great Powers of Europe, do not appear at all to their advantage.

The Barbary Corsairs represent, indeed, a strange phenomenon in the history of Europe and a strong indictment of the so-called civilized nations. It seems incredible today that such a state of things could have been permitted to exist; that for more than three centuries the Christian nations should have allowed their Mediterranean commerce to be carried on at the mercy of common pirates, letting themselves be humiliated and blackmailed, permitting their men and women to be carried into slavery, and paying tribute in money and naval equipment to a few bloodthirsty and arrogant bandits. The Venetians, Genoese, and Pisans in earlier days, the Spanish, Portuguese, English, French, Dutch, Danish, Swedish, Austrians, Germans, Russians, and Americans in more recent times had to buy security from piratical attack, although their combined sea

power was infinitely stronger than the small fleet of comparatively light craft at the command of the corsairs. For nearly 300 years the civilized nations stood in fear of a menace which the determined action of any one of them might have wiped out practically in no time.

Speaking of the ruler of Tunisia, William Eaton, U.S. Consul at Tunis around 1800, succinctly expressed the situation in this remark: "Can any man believe that this elevated brute has seven kings of Europe, two Republics, and a continent tributary to him, when his whole naval force is not equal to two line-of-battle ships?"

The reason for this cowardly and dishonorable attitude on the part of the Christian nations was the lack of unity among them, their political and commercial rivalries, their endless quarrels and mutual hatreds. It suited France to see the coasts of a hostile Spain raided by the corsairs; it pleased England and Holland to have the pirates prey on the maritime commerce of the lesser states and thus eliminate unwanted competition. These powers were ever ready to ally themselves with the Barbary States, even at the expense of humiliation, tribute, and loss to their own subjects. Under such conditions neither energetic action by one of the major maritime powers, nor any

BORN IN Austria, Mr. Sokol served in the Austro-Hungarian Navy in World War I, and later in the Dutch merchant marine. Coming to the United States in 1924, he obtained his Ph.D. at Stanford University, where he is now executive head of the Department of Asiatic and Slavic Studies, and associate director of the Pacific-Asiatic and Russian Program. In addition he conducts courses in naval history at the Hoover Library on War, Revolution, and Peace.

effective concerted procedure by all nations concerned was feasible.

Despite several half-hearted measures, it was not until after the beginning of the nineteenth century, after the United States had pointed the way to the proper way of dealing with the Barbary pirates, and after the Napoleonic Wars had evolved a greater readiness for international cooperation, that steps were taken for the definite elimination of this "Scourge of Christendom."

During the Middle Ages relations between the Christian nations and the Barbary States had, on the whole, been friendly. But even as early as 1390 Barbary corsairs began to trouble the seas, and at the urgent request of the Genoese, a force consisting of a "great number of lords, knights, and gentlemen of France and England" set out from Genoa to chastise them. After the expulsion of the Moors from Granada in Spain, in 1492, the situation at once became much more dangerous. Poor living conditions in North Africa combined with a desire for revenge in driving the expatriates to piratical enterprise. Their scattered efforts were soon welded into a more menacing pattern by the brothers Horuk and Khair-ed-din Barbarossa, who made themselves and the Turkish sea power the virtual masters of the Mediterranean. In 1541 they even succeeded in dealing a disastrous defeat to a great armada led by Charles V of Spain. But even after the Battle of Lepanto, which spelled the decline of Turkish sea power, the Barbary corsairs continued to roam the middle sea at will. Finding little effective opposition, they extended their activity into the Atlantic and along the coast of Europe as far as England and the North Sea, ravaging the shores, carrying off the inhabitants, and disrupting maritime commerce. The main centers of the corsairs were Algiers, Tunis, Tripoli, and Morocco.

The Christian nations did not, indeed, remain entirely inactive, and numerous attempts were made against these strongholds. But usually these expeditions were not carried far enough, and in any event they benefited only one nation, and that for a short time only. The others continued to suffer or pay tribute. Between 1609 and 1616, for instance, the Algerines, with about one

hundred ships at their command, captured 466 British ships, all the crews of which were reduced to slavery. When James I of England finally made up his mind to put a stop to this state of things, the belief in the invincible strength of the Algerines was still so strong that his admiral was of the opinion that it could not be done by one fleet, or in a single campaign, but that it was likely to be the work of years. He also suggested that all the maritime powers of Europe should contribute toward the expense of the operation, *and participate in the gains by selling the captured Moors and Turks as slaves!*

James, however, decided to carry out the expedition by himself and in 1620 sent against Algiers a fleet which, incidentally, was the first English naval force to enter the Mediterranean—at least since the Crusades. Another expedition was sent in 1637 against Salée in Morocco, and in 1655 Cromwell again despatched a fleet under Blake, which chastised Algiers and Tunis. Other punitive raids were made in later years, but the pirates quickly broke the treaties made and England continued to lose about a hundred ships to them each year. In 1661 the Dutch Admiral de Ruyter succeeded in releasing several hundred captives, but in 1712 the Hollanders still paid Algiers a tribute of guns and naval supplies, which enabled the pirates to strengthen their fleet, continue their depredations, and break the treaty within three years' time, so that the Dutch had to pay even more for the next truce. Between 1682 and 1687 the French bombarded Algiers three times, yet because the corsairs also hurt his rivals, King Louis XIV is said to have remarked that if there were no Algiers, he would have to make one. The same remark is also attributed to the Dutch and the English; it is evident that the attitude expressed by it was not conducive to energetic measures of suppression. Thus, despite all these expeditions, the corsairs grew in boldness and arrogance, and in 1660 the Algerines even demanded—and were temporarily granted—the liberty to search British vessels and to take out all foreigners and their goods!

If the great Sea Powers suffered such losses and indignities, the smaller ones

lly fared even worse. The Italian were left entirely helpless and had to use an unstable security by constant payments in money, goods, and lives. As in 1798 an expedition from Tunis landed on an island off the coast of Sardinia and captured nearly a thousand people, mostly men and children. Austria was reduced

to the humiliation of placing her seaborne commerce under the protection of her arch-enemies, the Turks. Prussia and the Hanseatic cities suffered from the depredations of the Mediterranean sea rovers and felt powerless to stop them as long as England gave at least her tacit approval. When the expected tribute did not arrive on time, the French at Algiers would put the consuls of the neighboring countries in chains and set them along with the other slaves, as happened to the British and Dutch consuls. Treaties requiring regular payments in return for immunity from attack were, however, made with a few of the stronger nations, but the pirates were not anxious to reduce the number of ships they could prey upon.

The incident of the eighteenth century may be used to illustrate the cowardly submission of the rich nations of Europe had fallen with respect to the Barbary Corsairs. Emperor Joseph VI, having added the Spanish islands to his Austrian domain, and recognizing the need for maritime trade, decided to organize the India Company of Ostend and to organize an imperial navy. But England, France, and Holland, disturbed by the rise of another competitor, forgot their quarrels long enough to unite in opposition to the new venture. Intimidating sailors would not take service under the imperial flag with death at the stake, putting every insurmountable obstacle in the way of running the ships of the new company, and even threatening the emperor with war, they refused him to abandon his plans. With the imperial company his new navy also collapsed, leaving the developing Mediterranean commerce of Austria entirely unprotected. When in 1764 Algiers declared war on Austria, without any other reason than to make Austrian vessels their "legitimate" booty, the imperial government was forced to stop their attacks. It was finally forced to build two frigates, but until these

were ready, two armed merchant vessels were to cruise against the pirates. The history of their "campaign" is a sad irony. It was felt unsafe to equip these two ships with metal guns, as that might incite the greed of the pirates. The report of their cruise made known to the Imperial Council states: "that the ships had the good fortune not to meet up with the corsairs, since ships, crews, and ammunitions certainly would have been lost if they had." When the two frigates were finally completed, Trieste, the imperial port city, objected to the cost of maintaining them and they had to be sold. In 1784 Austria was forced to sue for a treaty with Algiers and continued to pay an annual tribute.

No serious attempt to subdue the Barbary States was made until 1775, when Spain sent a naval and military force against Algiers. Owing to mismanagement and disagreement among the commanders, however, the expedition ended in disaster. It is noteworthy for us chiefly because one of the participants was Joshua Barney, later Commodore and hero of both the Revolutionary War and the War of 1812. In 1784 a combined fleet of Spain, Portugal, Naples, and Malta again attacked Algiers and fought a naval battle in the bay, without, however, engaging the batteries on shore, thus leaving the pirates' stronghold unimpaired.

The consequence of these failures, half-hearted attacks, and positive encouragement naturally was an unbelievable insolence of the Pashas, Deys, Beys, and Sherifs of the Barbary States, from which the large powers suffered almost as much as the weaker ones. Every fresh instance of submission only whetted their appetites and ran up the price of peace and immunity. No nation escaped the insolence of these tyrannical rulers, and even the representatives of England and France had to submit to unimaginable indignities. In order to force them to bow low to the Bey, they were obliged to creep into his presence under a wooden bar; not one of them seems to have had the courage or presence of mind ascribed to the Dutch envoy to China under similar circumstances, in entering the Emperor's chamber rear first. It was the energetic action of the young United States which finally showed up the inner weakness of the Barbary States and

pointed the way to a fairer settlement with them.

But during its first few years of existence the new Republic also had to pay tribute to these lawless bandits. As soon as they had learned to recognize the new flag as that of a new and as yet weak nation, the Barbary corsairs quickly began to prey upon its unprotected ships. From 1783 on American ships were lost to them in increasing numbers, to the detriment of the developing American maritime trade. Treaties of peace were concluded with—or rather bought from—Morocco in 1786, Algiers in 1795, Tripoli in 1796, and Tunis in 1797, for, as the Tripolitan ambassador in London expressed it: "Turkey, Tripoli, Algiers, and Morocco are the sovereigns of the Mediterranean; and no nation can navigate that sea without a treaty of peace with them."

Yet this buying of goodwill proved to be an expensive affair, costing about half a million dollars annually, including ransom paid for the liberation of American nationals and the delivery of warships and naval stores.

Among the American leaders of that time there were, of course, different schools of thought concerning the problem. John Adams, then minister to England, was in favor of making the required payments in order to insure the peaceful and profitable trade of the United States. In a letter dated December 15, 1784, to John Jay, who was secretary for foreign affairs during that period, he says: "Some are of opinion that our trade in the Mediterranean is not worth the expense of the presents we must make the piratical states to obtain treaties with them. Others think it humiliating to treat with such enemies of the human race, and that it would be more manly to fight them. The first, I think, have not calculated the value of our Mediterranean trade. . . . The last have more spirit than prudence. As long as France, England, Holland, the Emperor, etc., will submit to be tributaries to these robbers, and even encourage them, to what purpose should we make war upon them? The resolution might be heroic, but would not be wise. The contest would be unequal. They can injure us very sensibly, but we cannot hurt them in the smallest degree. . . . Unless

it were possible, then, to persuade the great maritime powers of Europe to unite in the suppression of these piracies, it would be very imprudent for us to entertain any thoughts of contending with them, and will only lay a foundation, by irritating their passions and increasing their insolence and their demands, for long and severe repentance."

Adams continued to urge a policy of peace and tribute, as expressed in another letter to Jay, of February 22, 1786: "If it is not done, this war (started by Tripoli in order to enforce tribute payments) will cost us more millions of sterling money in a short time, besides the miserable depression of the reputation of the United States, the cruel embarrassment of all our commerce, and the intolerable burthen of insurance, added to the cries of our countrymen in captivity. . . . If a perpetual peace were made with these states, the character of the United States would instantly rise all over the world. Our commerce, navigation, and fisheries would extend into the Mediterranean. . . . The additional profits would richly repay the interest and our credit would be adequate to all our wants."

On the other hand, Thomas Jefferson, then minister to France, considered war the only permanent solution of the vexing problem. On August 20, 1785, he wrote to John Page: "You will probably find the tribute to all these powers make such a proportion of the federal taxes as that every man will feel them sensibly when he pays those taxes. The question is, whether their peace or war will be cheapest? But it is a question which should be addressed to our honor as well as our avarice. Nor does it respect us as to these pirates only, but as to the nations of Europe. If we wish our commerce to be free and uninsured, we must let these nations see that we have an energy which at present they disbelieve. The low opinion they entertain of our power cannot fail to involve us soon in a naval war."

These two statements contain the basic arguments for and against a policy of appeasement. History eventually proved Jefferson right and Adams wrong. In fairness to Adams it must be stated, however, that he was not opposed in principle to strong

res against the Barbary corsairs, but in consideration of the weakness of the Government under the Articles of Confederation and the poverty of the young nation, it made effective naval preparations impracticable at that time.

Jefferson, too, was mistaken in his assumption that he could interest the various European nations in a joint action against the pirates. In his autobiography he makes the following statement: "I was very unwilling that we should acquiesce in the European practice of paying tribute to those lawless states, and endeavored to form an association of the powers subject to habitual depredations from them. I accordingly drafted and proposed to their ministers a plan, for consultation with their governments, articles of a special confederation. . . . Portugal, Naples, the Two Sicilies, Venice, Denmark, and Sweden were favorably disposed to such an association . . . and Congress was now wanting to bring it into debate and formal consideration but the assent of our Government and their authority were wanting to make a formal proposition. . . . But they were in no position to make any such movement. . . ."

What Jefferson had in mind was a perpetual blockade of the Barbary States by an international fleet, since bombardments proved to have only a transitory effect. It was, however, not only the inability of the American Government to implement the foresighted plan which kept it from being carried out. As long as England still considered the Barbary states valuable allies, nothing could be achieved by the weaker nations. The opinion of a large section of British opinion on the problem is, perhaps, best expressed in the following excerpt from a pamphlet published by Lord Sheffield in 1794, and aimed against a bill introduced by the United States and Britain: "It is not probable that the American States will have a very large trade in the Mediterranean; it will not be to the interest of any of the great maritime powers to protect them from the Barbary States. If they know their interests, they will not encourage the Americans to be so—because that the Barbary States are advantageous to the maritime powers is obvious. If they were suppressed, the little States of Italy, etc., would have much more of the carrying trade. . . . The Americans cannot protect themselves from the latter (Barbary States); they cannot pretend to a navy."

Actually, the rovers were privately encouraged by the English, who gave information to them of the sailing of American ships and are even said to have used their influence to bring about a truce between Portugal and Algiers, in 1793, for the express purpose of enabling the Algerines to prey upon American ships in the Atlantic. The seriousness of the problem can be seen from the fact that in that year eleven American ships were captured by the pirates. After renewed treaties and tribute payments, the American Mediterranean trade revived again to the extent that in the Spring of 1799 alone eighty American vessels entered that sea.

But in the meantime the Constitution had been adopted and a strengthened American Government could prepare itself for more energetic action against the corsairs, as well as any one else who tried to interfere with the legitimate interests of the country. The building of several frigates and other war vessels was finally agreed upon in 1794, and a few years later the United States was ready to send a naval force to the Mediterranean to ensure fair and equitable treatment of its merchant ships. The history of the ensuing campaigns with Tripoli and Algiers is well known and need not be reviewed here.

The beneficial results of these actions proved the efficacy of forceful measures in dealing with the Barbary pirates; it also showed what a comparatively weak force could achieve against them. For the United States this success spelled the end of perennial tribute and a very noticeable increase in prestige abroad, a result which certainly would not have accrued from any meek continuation of cringing, begging, and paying, or any other form of appeasement.

The question of Christian slavery was raised at the Congress of Vienna, and it was becoming plain that the European nations were not going to tolerate it much longer. Realizing that the main reason for protecting the corsairs had now vanished, Great Britain finally got ready to put an end to this

that Jefferson had in mind was a perpetual blockade of the Barbary States by an international fleet, since bombardments proved to have only a transitory effect. It was, however, not only the inability of the American Government to implement the foresighted plan which kept it from being carried out. As long as England still considered the Barbary states valuable allies, nothing could be achieved by the weaker nations. The opinion of a large section of British opinion on the problem is, perhaps, best expressed in the following excerpt from a pamphlet published by Lord Sheffield in 1794, and aimed against a bill introduced by the United States and Britain: "It is not probable that the American States will have a very large trade in the Mediterranean; it will not be to the interest of any of the great maritime powers to protect them from the Barbary States. If they know their interests, they will not encourage the Americans to be so—because that the Barbary States are advantageous to the maritime powers is obvious. If they were suppressed, the little States of Italy, etc., would have much more of the carrying trade. . . . The Americans cannot protect themselves from the latter (Barbary States); they cannot pretend to a navy."

perpetual irritant. Consequently, a British naval force, joined by a Dutch squadron, was dispatched to the Mediterranean, under the command of Lord Exmouth, in 1816. After a heavy bombardment of Algiers, the destruction of its fortifications and its entire navy, the Dey was forced to sign a new treaty stipulating the total abolishment of Christian slavery. The other Barbary States followed in quick succession in signing similar pledges.

But even this severe lesson was not enough to stop the corsairs. The fortifications of Algiers were soon repaired and new cruisers were sent to prey on the ships of the weaker nations. The problem came up again at the inter-European Congress of Aix-la-Chapelle, held in 1818, when many of the nations represented urged vigorous steps to end the menace once for all, either by a British force or an international naval fleet. But nothing came of it, because Great Britain was not troubled by the pirates any more, while she did not wish to invite Russian and other warships into the Mediterranean. Thus, the Two Sicilies, Portugal, Toscana, Sardinia, Sweden and Denmark, Hanover, and Bremen continued to pay tribute for another decade or two. Even Great Britain had to repeat her admonitions by sending a naval force to Algiers, in 1824, under Sir Harry Neale, an event which is of interest chiefly because it witnessed the first appearance of a war steamer, which, by the way, had her funnel shot away during the action.

Algiers was not subdued finally and definitely until 1830, when France, irked by the repeated insults of the Dey, and anxious to expand her influence, sent an expeditionary force there, consisting of a naval squadron under Admiral Duperré, and a military force of 37,000 men. Defeating the Dey's forces, capturing and occupying the town, the French took possession of the entire territory and incorporated it into their colonial system. After that the piratical exploits of Tunis and Tripoli also came to an end, although Tunis was not occupied by the French until 1881, while Tripoli was taken by the Italians, after their war with Turkey, in 1912.

Morocco, too, experienced a change of heart and promised the abolition of slavery and piracy in 1816. But mistreatment of

white visitors and piratical acts continued, and several demonstrations against that state became necessary before real peace was established. Thus, for instance, the Austrian vessel *Veloce* was captured in 1828, near Cadiz, by the Moroccan corsair *Rabia-el-Gheir*. It was taken to Rabat-Sallee, where the crew was kept prisoner. When the news reached Vienna, it was decided to send a naval force consisting of two corvettes and two smaller vessels to Morocco to free them. Fortunately, the preceding Wars of the Greek Liberation had induced Austria to re-establish at least a small navy. The Austrian squadron, under the command of the Venetian, Baron Bandiera, finally reached its destination early in 1829. As long as the captured crew was not freed, Bandiera could not resort to force against the pirates. After long negotiations the Austrian commander eventually achieved his first goal, but the release of the *Veloce* was refused. In retaliation Bandiera decided to take or destroy two of the pirate ships anchored in a river near Larache. Landing his small force, he marched up to where they were located, but was attacked by greatly superior Moroccan forces. He defended himself as best he could by means of the rocket guns in use at that time. Since he did not succeed immediately in setting the pirate ships on fire, two volunteers swam to the nearest one, which had been deserted by its crew, and ignited it. The second vessel had in the meantime been sunk by the rocket guns. Their mission thus concluded, the Austrian force returned to their ships, having lost 22 dead and 14 wounded. But although the Moroccans had suffered much heavier losses, the Moroccan Emperor was still unwilling to give in, and the towns of Arsilia and Tetuan also had to be bombarded before full satisfaction was obtained. Again, even a small force had succeeded where treaties and peaceful embassies had failed for centuries.

But the Moroccans were not finished yet. In 1844 and 1851 France was forced to bombard Sallee and other Moroccan cities again, and in 1856 a Prussian vessel was taken by Moroccan corsairs. This capture called forth the first war-like act on the part of the newly created Prussian navy. The Prussian flagship, the corvette *Danzig*, was dispatched there

the command of Prince Adalbert, first admiral of the Prussian navy. In a skirmish that developed near Cape Tres with Moroccan forces, the prince was wounded, while seven German soldiers were killed. Morocco was not completely pacified until the end of the nineteenth century. It was finally divided between France and Spain in 1912.

These colonial penetrations by European powers ended the menace of the Barbary corsairs, although the introduction of steamships and the general impatience with all interference with the free flow of traffic, characteristic of the nineteenth century, had led to check it even before that. We are concerned here with the ethics of colonialism, nor with the treatment the conquerors accorded their new possessions; but if the conquest of other countries was justified, it seems to be in the case of the Barbary States, which for centuries had de-

fied civilization and caused untold suffering, and which had a record of broken treaties and pledges which probably surpasses anything else of that kind ever known in the world's history.

It also seems that no better example of the uselessness and danger of appeasement can be found than the story of the Barbary corsairs, who for such a long time were allowed to intimidate Europe, when concerted action by the injured nations could have stopped them within the shortest time. But, as has become apparent from the preceding pages, it was the greed and selfishness of these nations which prevented both united procedure and effective action by any single member. They would rather suffer themselves than get together or share their advantages with their competitors. As long as such a shortsighted attitude is maintained, the Barbary States of the world will continue to prosper and plague humanity.



"NO CAR"

Contributed by CAPTAIN H. B. HUDSON, *U. S. Navy*

One day during the fall of 1943, while I was attached to the Enlisted Detail Section of the Bureau of Personnel, a Marine colonel came into my office and asked if I could give him some information concerning despatch orders recently received by a relative of his, who was a naval lieutenant. It seemed that the naval officer in question had received despatch orders from the Bureau of Personnel directing him to proceed via air transportation to Norfolk, Va., and thence to Camp Lejeune, New River, North Carolina. The officer wanted to find out why his orders had specified "No Car" as he was anxious to take his car with him to New River. The car was in Norfolk and the naval lieutenant had telephoned a Marine relative from Norfolk, saying he had just flown in from Bermuda and was desirous of obtaining permission to drive his car from Norfolk to his new station at New River, North Carolina but his orders specified "No Car," therefore he requested the colonel to see if he could get the "No Car" restriction waived.

It appeared to me that there was no reason why the naval lieutenant should not take his car to New River from Norfolk and all he would have to do was to go to the rationing board with his orders and obtain the necessary coupons for gasoline. I informed the colonel that I had nothing to do with the rationing of officers, but that as this "No Car" restriction seemed most unusual to me, I would be glad to try to assist him in getting a firm decision concerning the use of the car. I asked him to show me a copy of the Bureau of Personnel's despatch orders.

The colonel handed me a copy of the orders, to one Lieutenant — worded in the customary manner, directing him to "proceed to New River, No Car" etc. etc. After enjoying a good laugh, I pointed out to the colonel that No Car and So Car were frequently used for abbreviation of North Carolina and South Carolina respectively as well as N. C. and S. C. The red faced colonel thanked me and departed, first asking that I not publicize this rather unusual mistake.

PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS.)

A METHOD TO EXPEDITE MOORING TO A BUOY

By CAPTAIN W. F. RIGGS, JR., *U. S. Navy*

THE SIMPLE and "obvious" method of solving a problem often escapes us until old "Mother Necessity" steps in and prods us into devoting some concentrated thought to the matter. This thought, too, is often restricted by the inclination to adhere to traditional methods, and this inclination tends further to hinder ready recognition of the simple and "obvious" method.

In the fall of 1947 the writer was confronted with a problem which arose from circumstances familiar to most captains of naval vessels today. Shortly after taking over command of the U.S.S. *Providence*, which was completing her navy yard overhaul, he sailed with a crew who were largely green and untrained, particularly in regard to seamanship. Soon the day came when the ship was ordered to moor to a buoy in Narragansett Bay. The buoy designated was an elongated cylinder lying with its axis parallel to the surface of the water. Six by six inch wooden fenders, fitted along the sides of the cylinder, served as catwalks. Only three men were able to stand on the one catwalk that was above water. The ring of the buoy was very heavy. The water was rough. In spite of having a manila hauling line run through the ring of the buoy and led to a winch on deck, getting the shackle in proper position over to this ring and inserting the pin, while working on this unsteady platform, proved to be a most difficult task. To make a long story short, it required over an hour after the ship was in favorable position to accomplish the moor. Most embarrassing!

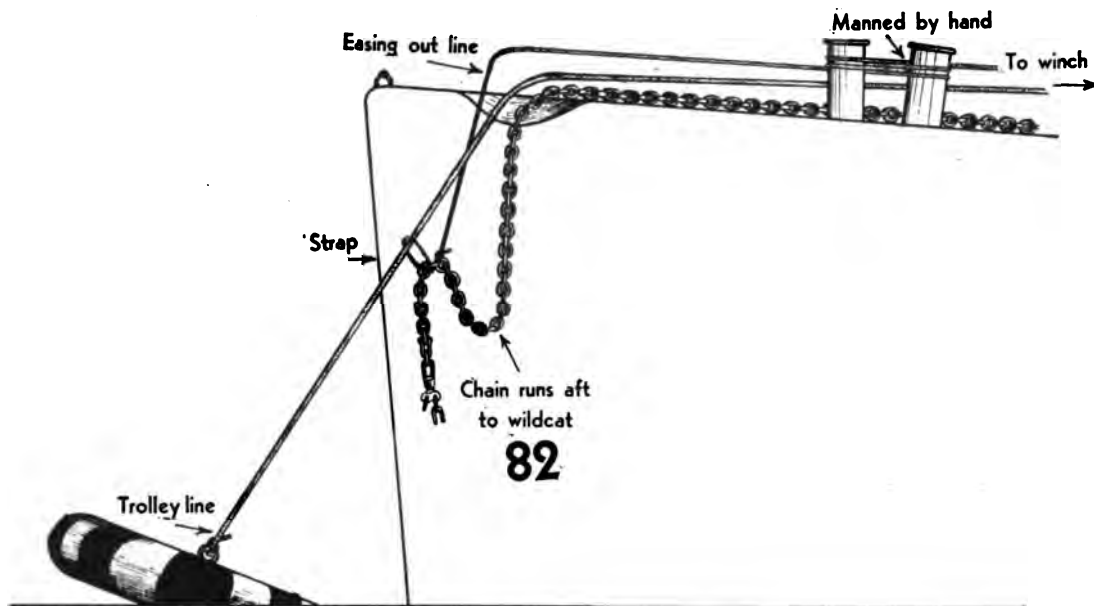
A few days thereafter and under similar weather conditions, it was again necessary to moor to the same buoy. This time, rat lines to haul the shackle over to the buoy were placed in a more favorable position, and a jigger was on hand to facilitate hauling the shackle over to the ring. All hands did their best to expedite the moor, but the operation

required approximately thirty minutes—still embarrassingly long.

That evening the writer attempted to analyze the problem. He made sketches which illustrated the forces involved; he sought to establish and clarify the difficulties, and thereby to find a remedy. When the first rough sketch had been completed, the thought struck him—"Why not lower the shackle down on a trolley extending from the forecastle directly to the ring of the buoy?" It would be easy enough to run such a wire from the bullnose to the ring, and a wire strap could be passed through a link of the chain near the mooring shackle and around this trolley wire!

The next time we moored we tried this rig. A one and five-eighths spring-laid mooring wire was used for the trolley because it was more flexible than a wire and therefore more suitable for handling on a winch; yet it would permit the strap to slide down easily. The third link of chain above the mooring shackle was selected as the most advantageous location for the strap. This would allow sufficient play to permit turning the shackle a quarter turn, if necessary, after it had been lowered down to the ring of the buoy. The end of the trolley that was to be carried out to the buoy was led out of the bullnose located on the same side of the forecastle as the chain we were going to use, and was stopped to the lifeline stanchions on this side,

A GRADUATE of the Naval Academy in 1922, Captain Riggs, as navigator and later as executive officer of the U.S.S. *New Orleans*, was present at Pearl Harbor on December 7, 1941, and participated in the battles of Coral Sea, Midway, and the Solomons campaign. Later he served on the staffs of Admiral Halsey and of Admiral Newton and then was assigned to the Joint War Plans Committee of the Joint Chiefs of Staff.



ready to pass to the boat which was to carry it to the buoy. The trolley strap on the chain was passed around the trolley wire. A wire easing out line was bent on to the chain just above the trolley strap, and its working end passed around bitts on deck with sufficient turns to permit easing out without danger of having it run away. A sufficient bight of the chain was walked out to ensure that when the mooring shackle was lowered it would reach the ring on the mooring buoy without the necessity of having to walk out additional chain.

The rig worked like magic. As the ship approached the mooring buoy, the mooring party in a whaleboat carried the end of the trolley line out to the buoy and shackled it to the ring of the buoy. As soon as this was accomplished the deck winch was utilized to take all slack out of the trolley, and haul the buoy towards the bullnose. When the trolley wire was about thirty degrees from a vertical position, the chain was eased down the trolley until the mooring shackle was in a favorable position. The men on the buoy had only to guide the jaws of the mooring shackle over the ring on the buoy and insert the pin. Comparatively little man-hauling in a horizontal plane was required. The moor was completed within three minutes after the ship reached a position where the trolley

wire was approximately thirty degrees from the vertical.

The *Providence* has now used this rig for approximately six months with consistently excellent results. Moors have been accomplished in from one to five minutes. The rough sketch shown above will serve to illustrate the rig.

The writer has questioned several experienced officers in the U. S. Navy as to whether or not they had ever used or heard of the trolley being used before. All stated they had not. During the recent cruise of the *Providence* in the Mediterranean the ship had occasion to demonstrate this method of mooring to British, Italian and French Pilots. None of these had ever seen it before, but all obviously, were most favorably impressed.

This method of mooring to a buoy has saved the *Providence* a considerable amount of fuel; the Chief Engineer no longer looks with trepidation upon the probable effect that mooring to a buoy instead of anchoring will have upon his score. It has, also, saved members of the ship's company many annoying delays in getting ashore. Moreover, since the end of the heavy chain is at all times kept under control and prevented from swinging freely, the method provides an important safety feature for the personnel working on the mooring buoy.



Official U. S. Navy Photograph

RUNNING IN LIGHT AIRS

This 44-foot Academy yawl is shown on an afternoon training sail. The midshipmen have set their spinnaker, the largest sail in the locker. All sails are nylon, which has proved durable, mildew proof, and generally satisfactory.

SAILING AT THE NAVAL ACADEMY

By LIEUTENANT COMMANDER VINING SHERMAN, U. S. Navy

DURING one of the late summer sailing regattas off Annapolis in 1947, I was pushing a U. S. Naval Academy yawl for the starting line, when, from a boat astern, someone bellowed "You're barging!" One quick look identified the boat as an Academy sloop, while the skipper of that sloop, a short, sturdy, ageless chap in south-wester and oil skins, who looked more like a pirate than a Corinthian sailor, was shaking his fist at me with considerable vigor. It was still eight seconds to the starting gun, according to my watch, but I was sure that if I didn't give this fellow room, he would board me physically. So I brought her up, my "middies" sheeted in, and we drove across the line as the starting gun blazed away to the tune of "You're over, you're across early!" from my friend in oilskins.

This was my first contact with Lieutenant Frank Siatkowski, U. S. Navy (Retired), who rose from the ranks and is now Sailing Master of the U. S. Naval Academy Sailing Squadron. As for our start, Frank still insists, the judge's failure to recall me notwithstanding, that I was over!

At this time I was an instructor attached to the Department of Seamanship and Navigation.

In April of 1948, I took over the duties of Naval Academy Sailing Officer. At the time I could not help remembering with a chuckle how, when I had first become acquainted with the Academy Sailing craft, during qualifications in knockabouts and yawls, I had repeatedly made the comment, "What a shame! They ought to be shot for letting these boats run down so!" I felt suddenly without a chuckle, as though everyone was a possible assassin with good cause, and I the deserving victim.

Anyone who knows boats cannot help admitting that the U. S. Naval Academy's fleet of ninety sail is as great a blessing as it is a responsibility. Starting with the large boats, the squadron craft are: the 88-foot

schooner *Freedom*; *Vamarie*, a 72-foot stay-sail ketch, an internationally famous Ocean racer; the 68-foot cutter *Highland Light*, Bermuda Race record holder; twelve 44-foot ocean-going yawls; the 43-foot sloop, *Nor-derney*, a blue water boat; *Elizabeth*, a 40-foot staysail schooner; ten 30-foot sailing whaleboats; three 26-foot half-raters; nineteen 26-foot knockabouts; thirty 12-foot sailing dinghies; and the *Mentel*, a colorful South Sea Island type canoe.

Sailing at the U. S. Naval Academy falls into three major divisions: (1) sailing drills, conducted by the Department of Seamanship and Navigation, employing the knockabouts, sailing whaleboats and yawls; (2) sailing as a sport, supervised by the Naval Academy Athletic Association, where varsity and pleb crews sail the "Tempest" dinghies in Inter-collegiate competition; open and Inter-Battalion regattas are also held in knockabouts and yawls; (3) recreation sailing, one of the most popular activities at the Academy.

Our first contest against formidable, big-time opposition came in June of 1948—the Bermuda Ocean Race. Assisted by a gentleman who is one of the most skillful blue water

GRADUATED FROM Dartmouth College in 1938, Lieutenant Commander Sherman enrolled in the V-7 program in 1940 and transferred to the Regular Navy after VJ Day. On December 7, 1941, he was an ensign aboard the U.S.S. *Dunlap* (DD-384), which was a member of Admiral Halsey's force returning to Pearl Harbor from Wake. Seeing continuous duty on the *Dunlap* through the various Pacific campaigns, Commander Sherman was executive officer of that destroyer before being ordered to similar duty with the new 2,200 ton *Fred T. Berry* (DD-858) after Iwo Jima was secured. The *Berry* was not ready for her first assignment until after VJ Day, but Lieutenant Commander Sherman did see postwar duty on board her in Japanese, Korean, and Chinese waters.



Official U. S. Navy Photograph

INTERCOLLEGIATE SAILING MEET

The dinghy float presents a busy scene when skippers from various East Coast colleges and universities meet to race these lively one-design, plywood boats, known as "Tempests."

sailors in America today, Lieutenant Commander C. Sherman Hoyt, U. S. Naval Reserve, of the New York Yacht Club, we commenced our preparations in May to enter four boats in the "dash" to Bermuda. Mr. Hoyt, who is known by kings and dukes as "Sherman," was brutally frank with us. "You don't have a chance," he said. At the request of Mr. John Nicholas Brown, who was then Assistant Secretary of the Navy for Air, Sherman had returned to active duty as chief advisor and ocean racing coach for the period of the race. There was no time for training crews, save on the sail up to Newport; there was little enough time even to make the boats ready for the ocean.

Nevertheless, as squadron commander of the racing group I was, if anything, overconfident. Great enthusiasm or willingness to participate has never been lacking in our racing crews. We all knew the history of

Naval Academy participation in ocean races—that as yet no one had ever placed. In the Bermuda grind of 1938, and in the New London to Annapolis Race of 1939, the beautiful *Vamarie* had failed to place; again to Bermuda in 1946, the *Vamarie* and the *Highland Light* were not with the leaders when Saint David's head rose out of the ocean; and in 1947 the *Vam'* and the *Light*, morally supported by the yawls *Resolute* and *Alert* over the Newport-Annapolis course, took no major silver, although my "Pirate Friend" Frank Siatkowski, drawing first blood for the Academy, captured the "governor's trophy" for Chesapeake Bay boats.

When I think back upon the 1948 Bermuda race, which was my first ocean race, my strongest conviction is that we underestimated the immensity of the task. And, perhaps even more dangerous, we under-



U. S. Navy Photograph

FIGHTING IT OUT ON THE SEVERN

an intercollegiate racing, the home fleet provides the boats, the skippers draw lots, and the fun begins. Emphasis is on skill. Boats are as near identical as possible.

ated the ability of those against whom ere to race. When I say that the caliber of competition which one meets in such is equivalent to the competition of Olympic try-outs, I do not exaggerate. When the last Naval Academy boat ed Bermuda after a four day period in h we had everything from a roaring fifty-norther to oily calms, we had suffered material casualties, and we still had all ls on board, but all that we had won was a t deal of experience. We were tired and marted inwardly with that breed of dis-ointment which comes when great effort ls poor returns. Worst of all, the boats, cursory attempts to paint and beautify t away, looked dreadfully shabby.

few days later, while attending a recep-for ocean racers at the Royal Bermuda it club one evening, I overheard the re- t, "Why does the most powerful Navy in world, representing the richest country e world, send such miserable-looking to represent them in an international etition such as this?" To myself I

had to admit that I was thinking alo these same lines. When, as skipper of t yawl *Lively*, I crossed the finish line far do in the fleet, I was certain that we had mu to learn about sailing and preparing f ocean races. And in addition I then began realize something so logical that it escap many even today—more than in any oth sport or activity, people expect the Unit States Navy to be outstanding when it com to sailing.

Actually the sport of sailing, through own merit, had already begun to pull its up by its bootstraps. Influential people w have known the sport and who have lo recognized its value at a Naval Acaden had already stepped forward. Foremost these were Mr. John Nicholas Brown, th Assistant Secretary of the Navy for A while the staunchest supporter of those w love to go to sea under sail at the U. Naval Academy was the Naval Acade Superintendent.

What had actually happened here at t Naval Academy was that we had be



Official U. S. Navy Photograph

BEGINNING OF A CBYRA RACE

The *Highland Light* leads the pack, the *Vamarie* takes the wind from an Academy yawl, and the civilian skippers enjoy Navy entries to beat—if possible. The Chesapeake Bay Yacht Racing Association sponsors cruising class races in the Bay throughout the summer.

caught in a doldrum caused by a temporary lack of interest in the sport at the policy level. With the increase in the number of sailboats and an increasing interest on the part of Midshipmen, the sport had outgrown the very minor role which it had formerly known.

During the summer of 1948 a Regular Navy captain who loved sailing came to Annapolis as the Commanding Officer of the station ship. At the same time Lieutenant Frank Siatkowski volunteered to come out of retirement and join us as Sailing Master of the Squadron. The chips, the paint, and the fur began to fly.

The adverse publicity resulting from the days of the doldrums now swarmed about our ears. It is my philosophy that everything happens for the best, and it has proved true in this case, for along with the critics there arose those of influence and ability who offered advice and help.

Here at the Naval Academy the "U. S. Naval Academy Sailing Squadron" was organized on a formal basis. It is composed of two divisions, the members of the Midshipman Boat Club on one side, the Officers and Civilian Faculty Sailors on the other.

We even changed the hull color of the knockabouts, yawls, and Class A boats to "Ocean Blue." Money was appropriated to overhaul the *Vamarie* and the *Highland Light*—the Oxford Board Yard on Maryland's eastern shore has made both of these fine boats as good as new—and the beautiful schooner *Freedom* will sail again for the first time in three years, thanks to Lieutenant Siatkowski and one midshipman first class who personally organized a group of seventy-five midshipmen into a part-time repair force, whose members on June 1 would sail the *Freedom* out of the moorings where she had lain so long.

In response to a request from the Superintendent a group now known as the "Fales Committee" was formed in January of this year from a group of prominent civilian sailors on the East Coast. The members have very graciously volunteered their time and skill to make a studied survey of Sailing at the U. S. Naval Academy with an eye toward making suggestions for improvement in our methods and equipment. Chairman of this committee is Mr. DeCoursey Fales of the New York Yacht Club, whose fellow members are Captain Charles L. Freeman, U. S.

Commanding Officer, U. S. Naval Ship, Annapolis, Mr. Carleton L. Jr. of Annapolis, Mr. Barklie Jr., of Princeton, and Mr. Robert Tier, Jr., of *Yachting* magazine. I may wonder about our preparations for this year's ocean race from Newport to Annapolis. With the end of May our out-of-land training of four entries will have been completed rather than just begun. We have the same skippers who went to the races for us in last year's Bermuda Race. One hundred per cent of our crew members will be sailed in at least one ocean race. As a result of these preparations, I don't make any predictions, for, in long distance sailing anything can happen; but, as a sport, it takes a well trained experimenter to make even the "breaks" pay. When this July issue is published, the race will be but a few days old.

On April 28, our crews, consisting of faculty instructors, and midshipmen of the class of 1949, line up as follows: the best entry, racing in Class A, is the cutter *Highland Light* (No. 34); will be our German-built sloop *Norfolk* (NA 13), a Class C competitor; the resolute (NA 3); and the yawl *Lively* (NA 1).

I may have gathered that I am enthusiastic about the sport of sailing. If so, you are right, yet, oddly enough, when I first associated with Naval Academy students, it was as assistant track coach with the sprinters and the quarter-milers. However when I assumed the Sailing duties, I automatically became a Midshipman and Officer Representative of the sailing team. More, perhaps, I have than any other sport, sailing gives the boy who is physically small an exciting competition in which he can successfully compete with even giants, the mark of success as a skipper being a keen eye, a knowledge of wind and sea, a self-reliance built up by skill in boat handling, a thorough knowledge of the right-of-way rules, and a love of competition. The most outstanding example I can name of a champion small in stature yet mighty at the helm is the internationally famous C. Sherman, my close friend and teacher.

There are, I confess, those who hold that not only does sailing fail to give the necessary exercise to be properly classed as a sport, but that since the days of engagements between sailing navies have passed, so has training under sail lost its value.

Those who declare that there is no exercise to sailing either have *never* sailed or they sailed as non-working guests. The fact that the sport is recognized nationally as well as internationally is undeniable. As for the contributions of this sport to officers of a modern navy, certainly a boy who, through commanding sailboats, carrying crews of two to nine, has proved to himself his ability to successfully handle a boat and command a crew, under all conditions of wind and sea, will be less apt to doubt himself when he commands other types, no matter what the size. To successfully skipper or act as a watch officer on a sailboat requires much command ability, self assurance, and foresight. Certainly there are few sports wherein a boy may better learn to respect equipment and acquire a sense of responsibility.

Not to be forgotten is the fact that through sailing small boats and ocean racers, Midshipmen, during an impressionable period of their lives, build up many pleasant associations with the sea which help them develop what generations of seafaring men have called a "love of the sea."

Few sports more than sailing bring out so clearly the true characteristics of a boy under conditions very close to those in which he will one day serve. When the storm winds howl, when the waves come pounding aboard, when you're wet and hungry and cold, a man's reactions are often quite a surprise to those who heretofore thought they had him "pegged." I have seen this many times during the long Bay races and out where the blue waves run between Newport and Bermuda.

The skeptics who dismay me are those who infer that few people are interested in sailing. Granted, it is not cut out as well as some to be a "spectator sport," but it is a tremendously fine competitors sport, and my experience with the brigade of Midshipmen has indicated that if enthusiasm is any gauge, then somehow we should make it possible for more of them to sail.



Official U. S. Navy Photograph

MAINTENANCE OF THE ACTIVE FLEET

Responsibility for maintaining the ships of the Active Fleet in a constant state of seaworthiness and sea-readiness is charged to the Bureau of Ships. Note the bluejacket dwarfed by the anchor upon which he is working.

THE BUREAU OF SHIPS

THE Bureau of Ships was created in 1940 when the Bureau of Construction and Repair and the Bureau of Engineering were abolished and the functions of those bureaus were taken over by the new bureau.

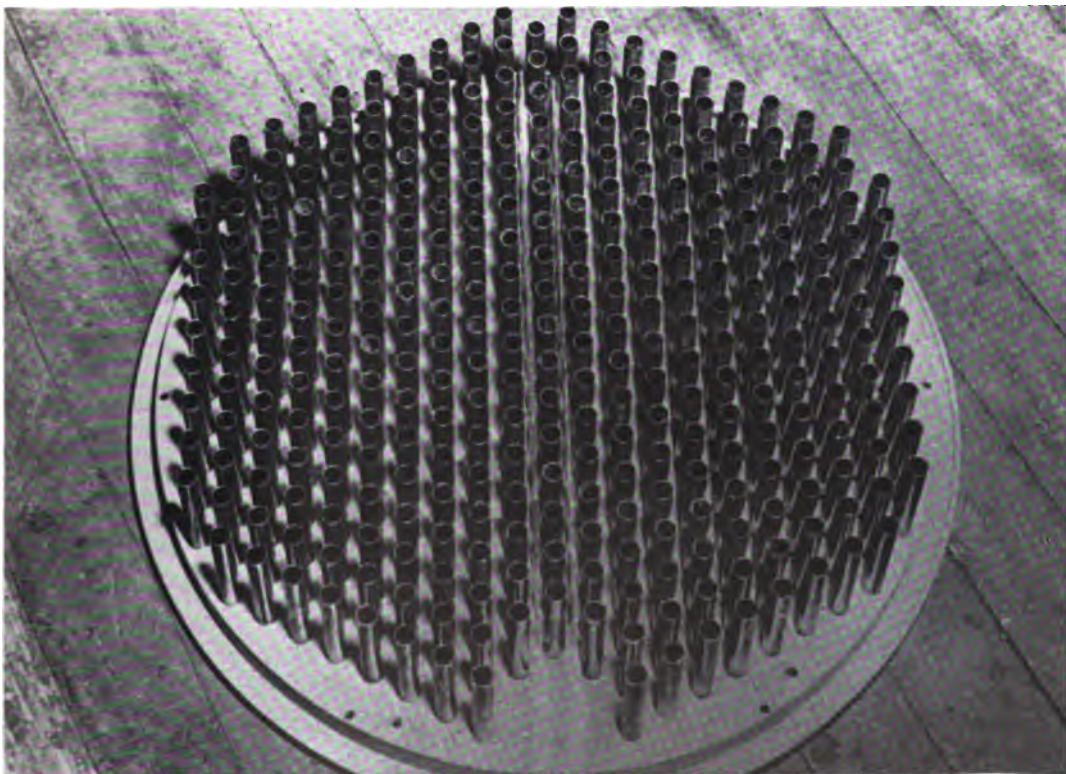
Charged with responsibility for the general design, structural strength, stability, and seaworthiness of all ships of the Navy, the Bureau is concerned with all the details of designing, building, fitting-out, repairing, and altering of hulls. It has similar responsibility in connection with main and auxiliary machinery of all types.

All of the electrical apparatus and equip-

ment used aboard ship, its design, manufacture, installation, and maintenance, is likewise under the cognizance of the Bureau.

Together with its responsibilities concerning shipkeepers, drydocks, and salvage, the inspection of fuels, and the preparation of specifications and tests for the equipment, material, and machinery under its cognizance, the Bureau of Ships represents one of the world's greatest engineering enterprises.

The photographs for this pictorial presentation of the Bureau have been selected to represent only a very few of these multitudinous activities.



Official U. S. Navy Photograph

SONAR, ANOTHER BUSHIP'S RESPONSIBILITY

Shown above is the rear view of the diaphragm of a sonar transducer. Sonar's controlled and directional sound signals, and its most sensitive reaction recording and evaluating devices, made it a highly effective anti-submarine weapon.



Official U. S. Navy Photograph

REPAIRING MAJOR MINE DAMAGE

This vessel lost her stern when she struck a mine in Alaskan waters during the summer of 1943. The scene shows giant cranes lifting a new stern into place, in a drydock at the Puget Sound Navy Yard.



Official U. S. Navy Photograph

BRINGING THE NEW STERN INTO POSITION

This picture illustrates the magnitude of the repairs accomplished in the maintenance of the destroyer fleet during the late war. So skillful were the engineers and workmen of the Navy Yards that the next-to-impossible was soon taken for granted.



U. S. Navy Photograph

SHIPYARD SURGERY FOR THE U.S.S. MENGES

torpedoes blew the bow off the *Holder* and the stern off the *Menges*, but both ships, or what was left of them, were able to make it to the New York Navy Yard and joined together to make a new *Menges*. Possibly *Mender* would have been a better name.



U. S. Navy Photograph

TWENTY DESTROYERS IN A ROW

Twenty destroyers at the Repair Base, San Diego, California, will receive the less spectacular but no less important maintenance work which is required if a fighting fleet is to keep on fighting.



Official U. S. Navy Photograph

NEW GUNS FOR A VETERAN BATTLESHIP

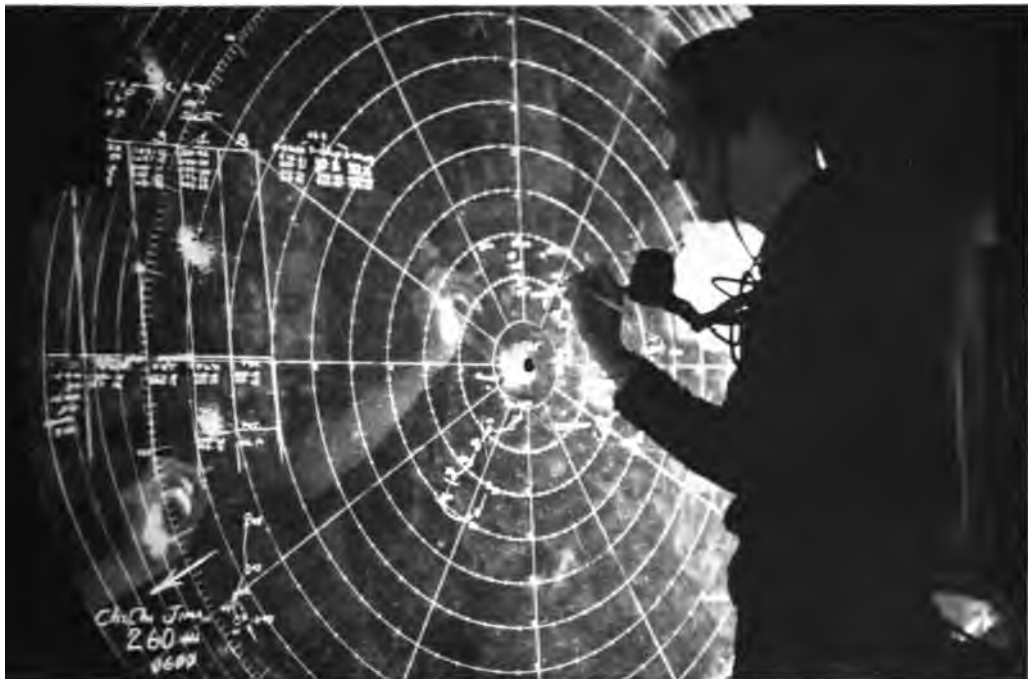
Their linings worn out by frequent firing, the 14-inch guns of this battleship are being replaced by guns with new linings at the Bremerton Navy Yard, Washington. A 250-ton hammerhead crane is used in the operation.



Official U. S. Navy Photograph

AFTER A KAMIKAZE STRUCK

The U.S.S. *Lamson* was hit by a Japanese suicide plane in Ormoc Bay, December 7, 1944. Despite the severity of her damage, she was able to return to the Puget Sound Navy Yard and was quickly repaired for further service with the Fleet.



U. S. Navy Photograph

RADAR PLOT FOR AN ESSEX-CLASS CARRIER

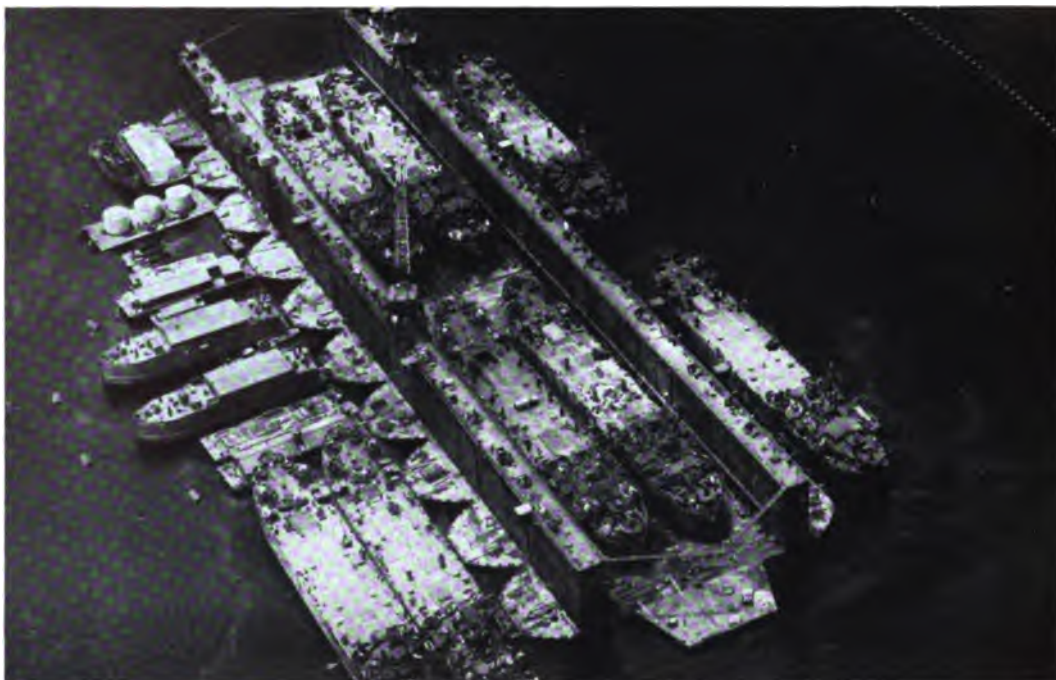
radar, one of the unquestionably decisive new scientific developments of employment in World War II, was used for a number of purposes aboard ship, including enemy-detection, fire-control, and navigation.



U. S. Navy Photograph

RADAR FOR SHIP AND PLANE

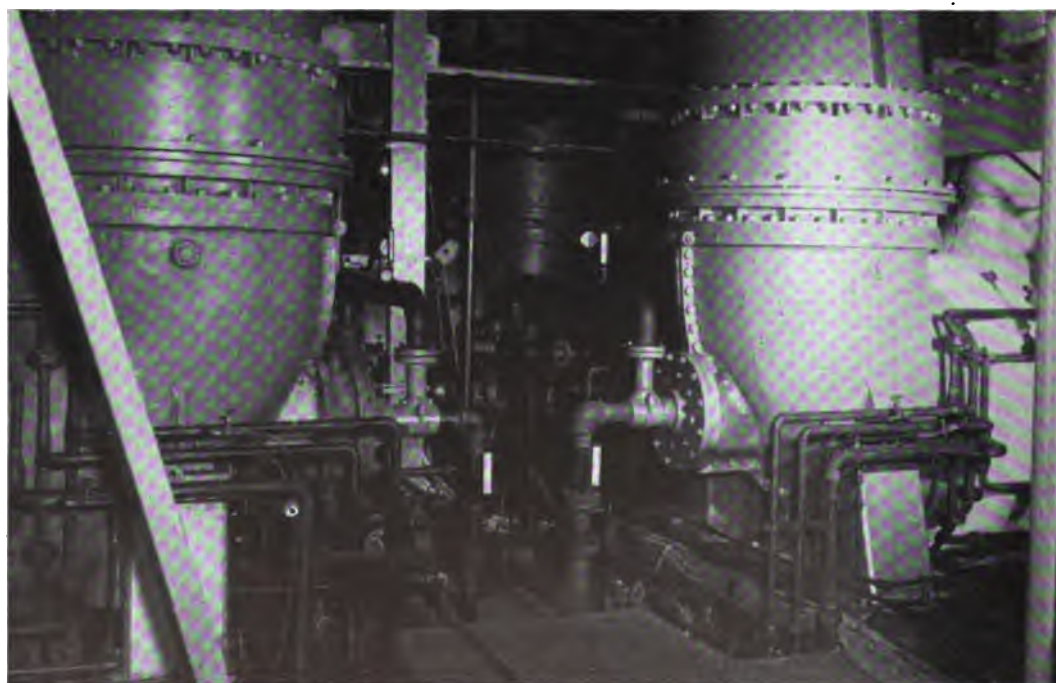
The ship has the trellis work of its various radar antennae outlined against the sky. Note that the *Avenger* in the foreground is also radar equipped, carrying what is known as a Yagi-type antenna.



Official U. S. Navy Photograph

BUSY DAY FOR A FLOATING DRYDOCK

Nearly 7,000 ships of the U. S. Fleet, ranging in size from PT boats to the 53,000-ton battleship U.S.S. *Iowa*, were lifted out of the water for damage repair and reconditioning by the Navy's seventy-seven floating drydocks in the combat zones during the last year of the war.



Official U. S. Navy Photograph

GAS TURBINE EXPERIMENTS AT ANNAPOLIS

The Naval Engineering Experimental Station, across the Severn from the Naval Academy, conducts tests on many kinds of propulsive machinery. These two gas turbines were being tested in 1946.



Official U. S. Navy Photograph

DETAIL OF THE MOTHBALL FLEET

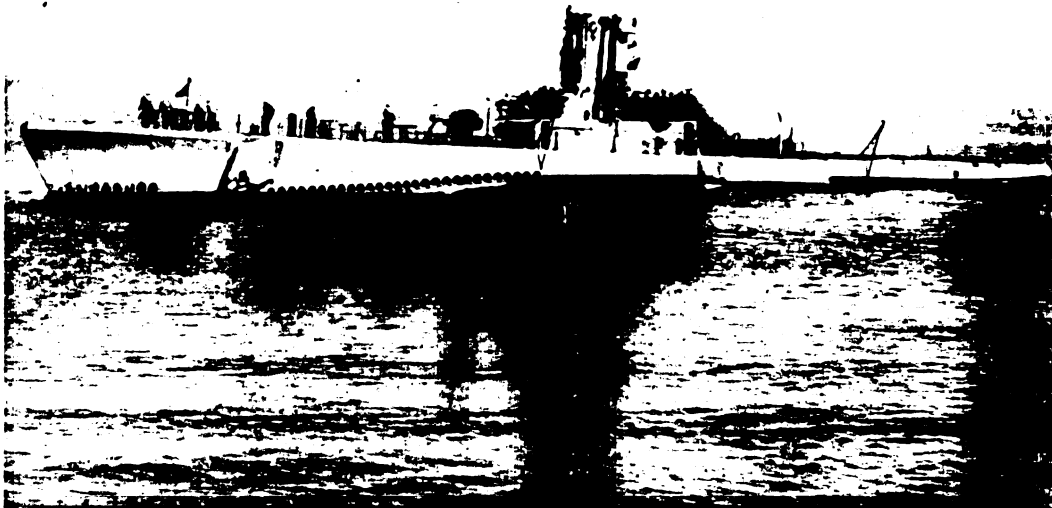
When ships must be laid up, this is how to do it. Above is shown a few of the five-inch guns of the U.S.S. *Brooklyn* and the U.S.S. *Phoenix* in a plastic storage package. These cruisers are tied up at the Philadelphia Naval Shipyard.



Official U. S. Navy Photograph

NOT DISINTEGRATING INTO RUST

These ships which contributed mightily as part of the great victorious fleet of World War II can be made ready for sea in a remarkably short time. Constant inspection and routine maintenance are essential, however.



Official U. S. Navy Photograph

TROOP TRANSPORT SUBMARINE

Some of the most interesting post-war developments in ships have to do with the submarine. Here is the U.S.S. *Perch* converted for transport service. The large cylindrical chamber abaft the conning tower is for the stowage of amphibious landing equipment.



Official U. S. Navy Photograph

PLASTIC PERSONNEL BOAT

Experimentation in post-war materials includes the manufacture of this molded, plastic 28 foot boat. Tests conducted at the Philadelphia Naval Shipyard showed this design superior to that of similar boats constructed of plywood.



U. S. Navy Photograph

A GIANT OF THE SEA IN AN EAST COAST DRYDOCK

matic contrast between the huge bulk of a large ship—in this instance an aircraft carrier—and the mere , have created it is a favorite subject for photographers. This contrast does not seem to lose its effectiveness ition.



Official U. S. Merchant Marine Cadet Corps Photograph

THE MERCHANT MARINE ACADEMY HONORS ITS DEAD

Ceremonies at the U. S. Merchant Marine Academy, Kings Point, N. Y., before the memorial to the 208 cadet-midshipmen and graduates who gave their lives in World War II.



DISCUSSIONS COMMENTS NOTES

More About the Merchant Marine

See page 1467, December 1948 PROCEEDINGS
and page 225, February 1949 PROCEEDINGS)

R. EDMUND A. CRENSHAW, JR.—No med person either in or out of the Navy ions the desirability of an adequate hant Marine. Nor is anyone inclined to rage the service rendered by the mem- of the Merchant Service who played the on the square or who gave their lives in service.

rather revealing statement in Mr. s' discussion in the February PROCEED- is his comment that "Not the least of eadaches was the United States Navy." the repeated reference to "helping the r."

obably the Navy has a lot to say as to aches caused by the Merchant Marine. the most important point is that Mr. s seems to forget that the Second World was his personal war just as much as s that of the Navy or our Country, and it was the bounden duty of all *loyal* ns to do everything within their power lp to win the war.

ie Navy did not promote nor start the But had the Navy failed to do its full e in winning, Mr. Faries and his col- es of the Maritime Union would now be ing for Hitler or the Japs at a rate of far below that of which he complains as inadequate.

to the rate of pay, it might have been r had Mr. Faries informed himself a better as to the Navy pay scale. An is very far in either ability or responsi- from the equivalent of a Boatswain's s, first class, in the Navy. The compari-

son would be more nearly accurate with a Seaman, first class. Here the base pay was about equal, *but* the Navy man received no overtime, though he usually worked much more than eight hours, and he received no bonus nor other special additions.

According to the pay rates, etc., which Mr. Faries gives, it was admittedly possible for his Merchant A.B. to draw as much as \$390.00 per month, and this again does not mention overtime, nor apparently some of the extra bonuses. He ignores the fact that overtime was a very large part of the pay of most unlicensed personnel.

Another item also omitted is the special award of \$125.00 to each member of the crew when his ship was in a port subject to an air attack whether or not his ship was in any way involved. Navy gun crews on the same ships of course received not one cent. The Navy man's pay is his full time annual pay. It might be well also to mention that Navy men paid for their insurance just as anyone else did, and that they also paid for their own clothes after the first issue, and that they were required to have a much larger outfit than civilians ever carried.

Even with the family allowances for married men (of course most of the younger men were unmarried) Navy pay never came near equalling the total pay of their contemporaries in the Merchant Service, where bonuses were lavishly handed out. For example the bonuses were paid in the Mediterranean long after the last German sub had been sunk there and while ships were running unescorted and with lights on at night. This was hardly a dangerous condition.

A further comparison which should not pass without explanation is the frequently cited one of the much larger Navy crews.

This is grossly misleading. Whether or not any Navy tanker carried a regular crew as large as 315 as stated I do not know—I never saw one. But this is beside the point. The Navy crew included full gun crews and fire control personnel as well as signalmen, full time radio and radar watches, and many other details not present on a merchant ship. Also nearly all Navy tankers were able to fuel other vessels at sea, which required extra hands. Many of them could handle two large or four small vessels at one time, and no merchant crew could undertake this as a regular routine.

The most prominent difference however was the fact that Navy crews took care of all but the most extensive repairs and kept their ships clean and in operation for long periods at sea. It was possible to tell a Navy manned ship from a merchant ship as far as you could see merely from the external appearance.

No one begrudges any rate of pay to Merchant Service or any other personnel if they make a fair return for the money. But the present attitude is to consider the base pay as retainer pay and demand overtime or other extra compensation for any work other than routine watch-standing.

During such time as we had a successful Merchant Marine, it was not run on such a basis.

CAPTAIN G. E. ELY (DM) U.S.N.R. (INACTIVE).—The article concerning "A Well Disciplined Merchant Marine" by Lieut. H. F. Crouch, U. S. Coast Guard, in the December 1948 PROCEEDINGS was excellent in many respects. To my way of thinking, however, he does not give a true picture or the whole story. That does not lessen the value of the article whatever because it will make many take stock and examine the present conditions with a critical eye. Personally, I view the article as a challenge to the professional Merchant Marine Officers to speak up and let one and all know how they feel about such a vital and controversial subject.

It would appear to be the favorite indoor sport of the Coast Guard to point its finger at the civilian Merchant Marine and decry the lack of discipline—then, in the same breath almost, admit they can not do any

thing about it because they do not have the proper authority. And, quote, "they can not be everywhere at once." Such being the case, why did they not leave the merchant ships under the jurisdiction of the Department of Commerce? We were doing all right under a civilian agency. And the Steamboat Inspection Service, charged with the regulation and supervision of the merchant ships, was composed of men raised and trained aboard cargo, tank, and passenger ships. They knew the problems, conditions, and personnel of the merchant ships. They were all graduates of the school of experience. We all spoke the same language.

The American Merchant Marine, as a whole, once enjoyed the distinction of having the best disciplined ships sailing the seven seas. Our reputation was world-wide for having the cleanest ships, the best paid, best fed, and hardest working crews under any flag. The "Fire Axe Maniac" and the "Knife Artist Dope Addict" would have had short shrift in those days. The Master would not even have heard about the Utilityman who did not want to work (the Cook would have taken care of that little item). And any member of the crew that sent for the Captain to come and see him would have been considered plain daft. He would have been, too. Perhaps the means of maintaining discipline were a bit harsh at times but they were effective—and harsh only when asked for it that way. I did not hear anyone complaining in those days of lack of discipline on our merchant ships. It was pretty darn good.

Then what happened to this good discipline? Laws were made to protect the malingerer, the disobedient, and the insubordinate. The authority of the Master and Officers was reduced to Logging the offender for infractions of discipline and to firing the man at the first opportunity—the right to discharge a man remaining as the most effective means of keeping good order aboard ship.

Next came the power of the Unions to undermine the lawful authority of the Officers aboard ship. They believe in discipline all right—Union discipline. If a Department Head aboard ship desired to let a man go he had to get permission from the Union Delegate. On the other hand; if the

Union wanted to take a man off the ship for some infraction of their rules there were no if's, and's or but's about it; he paid off. The Union discipline has been known to be harsh but effective at times, also. But then the Unions are not to be held responsible for anything; and I do mean anything. That would be unfair to Organized Labor.

When people rant about the poor discipline maintained on board our merchant ships they always seem either directly or indirectly to assume the attitude that the officers are to blame. The officers should do this; the officers should'n't do that; the officers should have more education; the officers should be well versed in maritime law. I suppose that when some drunk starts carving his initials with a fire axe, the officer should start quoting the Federal Register, section so and so, to bring him under control. Are the Officers to blame when laws are passed stripping them of their authority to "enforce" discipline? Are the officers to blame when the company signs working agreements with the unions that strip the officers of all but the last vestige of authority? Are the officers to blame when, having tried to uphold their authority in a legitimate case of Logging, the company lets them down and engages another officer after the Union "cannot" place a crew on the ship?

It seems to be the modern sport to make the Officers the goat for all ills. The man who has decided to make living and working aboard ship, carrying our commerce to all the corners of the world, his life long career; the man who forgoes a normal home and family life that the blood of commerce may flow; the man who by his initiative to study and work his way up through all the various grades to a responsible position; the man who knows by bitter experience how hard it is to keep a ship in first class condition and operating efficiently in this day of lax and indifferent crews; the man of proven ability who has dedicated his life to his profession—that is the man the Unions condemn as the harsh slave driver, and the bureaucrats as the spineless officer who does not maintain discipline. Yet many a Master from the American Merchant Marine after very short training on Navy ships during the war was promoted to duty in Command to the great

satisfaction of the United States Navy, Many Merchant skippers in the Naval Service were commended by Boards of Inspection for their clean and orderly ships and well disciplined crews; and many who acted as Task Group and Task Unit Commanders were commended by Admirals on the smart manner in which they maneuvered their formations of ships. All they needed to run a clean and well disciplined ship was authority, without having to consult with the ship's Delegate.

The picture may look black, but all is not lost. In my present position as Master of a tanker I would presume to place my crew alongside that of any auxiliary of either the Navy or the Coast Guard for a comparison of neatness, cleanliness, and good discipline. There are many favorable factors that make this possible. First and foremost, the ships in my company's fleet operate open shop. Consequently all our personnel are employed through the Marine Department office at our main terminal. In this manner we are able to select our personnel with an eye to character and ability. The second important factor is that our ships are on a coastwise run, and therefore it is not required that we sign articles for a round trip in the presence of a U. S. Shipping Commissioner. Each member of the crew signs an article of agreement with the Master as to wages, etc. This agreement may be terminated by either party at any port. In this situation, when our longest trip is three days, if we ship someone who turns out to be unsatisfactory we are only cooked on the deal for the length of time that it takes us to reach the next port. As we always carry more qualified personnel than the law requires, when some one is let go or exercises that perennial American prerogative "to quit" we are never delayed at sailing time by being short handed.

Judging by the number of applications always on file with our personnel department for employment, there seems to be a goodly percentage of the unlicensed men that would prefer to sail without the union's benevolent jurisdiction. They are steady, sober, conscientious, and hardworking, and I could not ask for a better disciplined crew on a ship of any type. At sailing time everyone is on

board, sober and ready for work. They are well aware that insobriety will not be tolerated. The net result is that drunkenness seldom occurs, for it then becomes "an example."

What does this add up to? A steady crew with a very small percentage of turnover. The majority of the unlicensed personnel on our vessels have a record of employment with this company of from one to three years, with longer records for a few and a negligible number with less than a year. There are no "beefs"; the authority of the officers is accepted as final. And last but not least by any means, there is a spirit of friendly co-operation engendered by a policy of fair, square, and just dealing for every one.

So for the safety of the nation we must have a well disciplined Merchant Marine? That can be accomplished in short order. Just restore the rightful authority of running the ship where it belongs: in the hands of the officers who are held responsible for the safety of the ship and all on board.

Fire-Bill of the U.S.S. Congress

MR. JAMES F. GALLIGAN.—The document transcribed below is from the Browning Family Papers, one of a number of collections of the Naval Historical Foundation. Lieutenant Robert L. Browning, U. S. Navy, was First Lieutenant of the United States Frigate *Congress* from 1842 to 1846, when this fire bill was in effect. During his duty in the *Congress*, the ship toured the Mediterranean and South American ports. This century-old fire party organization plan is a sharp contrast to the present-day system aboard modern men-of-war.

FIRE BILL

of the

U. S. Frigate *Congress*

In the event of an alarm of Fire on board the Frigate *Congress*: The Officer of the Watch will immediately direct the Drummer to beat to quarters, informing the Commanding Officer on board at the instant. The Officers Commanding Divi-

sions on the Main deck will immediately repair to their quarters, and see that the 2d Captain and Firemen, stationed at their Guns, are prepared with buckets to repair where they may be directed, by an order from the Quarter Deck: That the Scuppers are stopped fore and aft, under the charge of a Midshipman, from the 2d Division, and to wait for further orders from the Quarter deck. The Sailing Master will immediately have whips rigged on each arm of the lower yards, by the Topmen stationed in the Tops, for drawing water, and see that the tubs are ready to receive it. The Masters Mate of the Quarter deck, with men stationed at the Braces, will be ready with the Fire Engine or Force pump hose on the Spar deck. The Boatswain and his Mates stationed on the Fore Castle, with the assistance of men stationed to pass Cartridges from the Fore Magazine, will immediately collect the Ship's buckets for passing water. The Officer Commanding the Fore Castle Division will see that the head pumps are rigged and fetched, the hose ready to lead water on the Main deck, and manned with the men stationed at the Chase gun, with the exception of the 2d Captain and Fireman. The Carpenter's 1t Mate will immediately have the cistern filled with water, or open the Force pump bilge cork. The Carpenter with the rest of his Crew, who are not 2d Captains, Firemen or Winchmen will be ready with the Broad Axes to repair where they may be directed, by an order from the quarter deck. The Masters Mate with the Captains of the Holds, will lead the hose from the forward or after cork into the passage of the forward Store rooms and be ready to let water into the Store rooms when ordered.

The Yeoman will be at the door of the Store Room, with his keys, but is not to open it until ordered. The Gunner, Master at Arms, and Ships Corporal will be at the Light Room Scuttle ready to let in water to drown the Main Magazine, in case the Captain or Commanding Officer should so direct.

The Marine Officer will parade the Marines under Arms. The 1t Lieutenant will immediately repair to that part of the Ship where the alarm originated.

(AUTHOR'S NOTE: The diction, punctuation, and capitalization in the above are the same as in the original document, which was written in a flourishing longhand on paper that has long since turned a mellow brown.)





From an Old Print

IMPERILLED BY STORM—WITH HAMPTON ROADS STILL TO COME

The U.S.S. *Congress* riding out a storm in the harbor of Naples almost twenty years before her last fateful fight with the Confederate *Merrimac*.



Official U. S. Navy Photograph

ONE OF THE QUIETER DAYS AT ANZIO

In his recent book, the famous British military writer, Major General Fuller, pointedly criticizes the Allied command for not making more vigorous use of amphibious warfare in the Italian campaign, as compared to its great success in the Pacific.



BOOK DEPARTMENT

Both regular and associate members of the Institute may save by ordering books through the Book Department. A discount of 10% is allowed on books of other publishers (except on foreign and government publications, and on books on which publishers do not give a discount). Allow reasonable time for orders to be cleared and books to be delivered directly to you by publishers. Address Secretary-Treasurer, U. S. Naval Institute, Annapolis, Maryland.

THE SECOND WORLD WAR, 1939-45; A STRATEGICAL AND TACTICAL HISTORY. By Major General J. F. C. Fuller, C.B., C.B.E., D.S.O. London, England. Eyre and Spottiswoode, 1948. 412 pages. Illustrated.

REVIEWED BY LIEUTENANT COLONEL J. D. HITTLE, U. S. MARINE CORPS

This, the latest addition to General Fuller's long list of books, is unquestionably his most important contribution to military literature. "The Second World War" is more than an assembly of historical facts; it is a scholarly, penetrating critique of the late war written in the vibrant style that military readers have long recognized as Fuller's literary trademark.

In writing this book, the author has been able to do something seldom encountered in current military writing: evaluate strategy in terms of land, sea, and air power. Quite objectively, he refuses to belabor the reader with special pleadings for any one arm or type of weapon. This feature alone gives the book an almost unique quality among post-war histories.

Naval readers will be particularly interested in Fuller's frequent observations regarding the Allied and Axis employment of sea power. While he accords Wavell's brilliant desert campaign the credit it so well de-

serves, Fuller's admiration for the tactics of the desert victory does not prevent him from emphasizing that it was the proper employment of British sea power that made Wavell's desert conquest possible. On the other side of the ledger, though, the author is not hesitant to criticize sharply the failure of allied leaders to exploit the inherent mobility of sea power's amphibious operations in the campaign up the Italian boot. The American military mind, which has far too often failed to understand the full capabilities of sea power, could well afford to contemplate Fuller's terse but axiomatic statement "in coastal operations he who commands the sea can nearly always find an open flank leading to the enemy's rear—the decisive point of every battle."

Again, with respect to sea power, Fuller deplores the British creation of a single air force with the resultant failure to incorporate strong carrier forces into fleet organization. At the same time, however, he fully recognizes—again something frequently overlooked in this country—the uniquely American balanced fleet concept of naval organization, providing naval commanders with all-naval combat teams of ships, carrier aircraft, and Marine landing forces.

The author demonstrates further understanding of the nature and character of U. S. Naval power by asserting that U. S. am-

phibious doctrine (developed by the Marine Corps and the Navy) was "in all probability . . . the most far reaching tactical innovation of the War." While recognizing the dominant role of sea power, the author gives considerable attention to the question of air power.

Readers on this side of the Atlantic will be severely jolted by General Fuller's analysis of the allied employment of the air weapon. Although we have, with few exceptions, come to accept the current concept of strategic bombing as battle tested and valid, numerous British writers have severely questioned the effectiveness of such strategic bombing during the late War. Fuller most emphatically sides with the critics of strategic bombing. In so doing, he repeatedly attacks the Douhet-Mitchell theories of air power. Indeed it will come as a surprise to many to read that during the period of increased allied strategic bombing from 1942 through 1944 German over-all munitions (tanks, air craft, weapons, etc. . . .) production more than tripled!

We are also told that the mass saturation bombings failed to undermine the productive efficiency of the civilian populace. On the basis of such data, all the more startling because it is quoted from the "U. S. Strategic Bombing Survey," Fuller unequivocally states that the strategic bombing of Germany, even up through the spring of 1944, was an "extravagant failure. Instead of shortening the War, its cost in raw materials and industrial manpower prolonged it." Such an indictment of strategic bombing is doubly serious, coming as it does from the pen of J. F. C. Fuller who has made it habit during his long career as soldier and writer to know whereof he speaks. There can be little doubt but that General Fuller's exposé of the allied strategic bombing effort will result in a more critical examination of the capabilities of independent air power.

This is a book that deserves a "must" rating on the reading list of every service and civilian reader who is interested in the basic issues of national security.

THE UNIVERSE AND DR. EINSTEIN.

By Lincoln Barnett. Introduction by Albert Einstein. New York. William Sloane

Associates. 1948. 121 pages+ bibliography + index. \$2.50.

REVIEWED BY SENIOR PROFESSOR EARL W. THOMSON, UNITED STATES NAVAL ACADEMY

The present volume is not a biography of Dr. Einstein. Rather it is an interpretation of the Einsteinian additions to basic scientific thinking from 1905 until the present. As such it includes the necessary contributions of Planck with the quantum theory, of Lorentz with the equations of transformation, and of many other modern physicists.

An historian, who synthesizes the events of history and places them in their proper relation on the printed page, does not necessarily have to be a shaper of history, a statesman, a diplomat, or a military man. However, until the present, our better scientific writers have been primarily scientists, with scientific accomplishment in the laboratories or the classrooms as part of their background—Shapley, Gamow, Eddington, Jeans, and Einstein himself. Mr. Barnett does not meet this criterion. He is primarily a journalist who has adopted science as his field of writing. As long as he merely interprets the Einsteinian philosophy and mathematics, which have been proven by experiment and adopted by scientists, his writing is excellent. However, when he wanders amidst the "evanescent wraiths" of macrocosmic philosophy his style becomes too poetically prettified for the digestion of the average scientific reader. For example: "Man is, in the final analysis, merely an ephemeral conformation of the primordial space-time field."

(Mr. Barnett develops well the thesis that there is nothing sacrosanct about scientific laws, that our laws are a function of the five senses, that we are deceived by limited perception, and that particular laws have been adopted only because the thinking of man has developed along that line. Scientific law is a function of man, and not the reality itself.)

Mr. Barnett's book is excellent reading within its particular scope of interpretation. It is only too bad that it is burdened with the blurb on the jacket which claims that "the final sections of the book convey an emo-

tional impact like that of the last movement of a symphony." The best symphonies are still written by musicians, not journalists.

JANE'S FIGHTING SHIPS, 1947-48 (Corrected to July 1948). Edited by Francis E. McMurtrie. New York. The Macmillan Company. 498 pages. \$20.00.

REVIEWED BY ASSOCIATE PROFESSOR
ELLERY H. CLARK, JR., U. S.
NAVAL ACADEMY

This golden anniversary edition of *Fighting Ships* is a splendid volume and stands as a fitting monument both to founder Fred T. Jane who died in 1916 and to Francis E. McMurtrie, the editor since 1934 whose recent death occurred on February 23, 1949.

Fifty years have wrought many changes in this distinguished naval annual. A comparison of the first and fiftieth editions shows that the latter has over twice as many pages (498 as against 221) and is written in English, whereas the earliest was written in English, French, German, and Italian. Moreover, the original contained 448 pen-and-ink sketches by Jane while this latest issue has over 500 new photographs in addition to many older ones again reproduced. Five warships sketched in the 1898 edition have survived the intervening years and their photographs appear in this latest production.

Several features distinguish this jubilee publication from its predecessors. Editor McMurtrie's article "Fighting Ships and its Founder" carefully reviews the career of Jane and the yearly development of his annual. The founder's authorship of several novels and naval books and of a war game are emphasized as well as his widely recognized productivity as a naval artist.

Another special inclusion is a section of silhouettes of the world's ironclads from 1860 to 1945 with particular emphasis on those of Britain, France, Germany, Italy, Japan, Russia, and the United States. Appended footnotes add significant technical and historical data. There is also an index of all the major warships described within the covers of *Fighting Ships* during the past half century.

A third valuable addition is a discussion, illustrated by two photographs and a sketch,

of the careers and ultimate destruction of the Japanese warships *Yamato*, *Mushashi*, and *Shinano*. In addition, a third and presumably final war loss supplement contains a very detailed account of Japanese naval losses.

The British wartime naval construction record is carefully itemized according to the productivity of each of the building yards. The quantitative leaders in their respective specialty included: Vickers-Armstrongs (Barrow), 94 submarines; Harland & Wolff, 8 carriers; and Swan, Hunter, & Wigham Richardson, 31 destroyers.

Among the photographs there are, as usual, many striking ones, including views of the *Crossbow*, *Guam*, *G. Leygues*, *Missouri*, *Ontario*, and *Yamato*. These maintain Jane's original sketch objective that "utilitarian distinctness is the one thing aimed at."

None of the Russian photographs is of particularly recent date and the editor comments that it is evident that "Russia, like Germany, is inclined to rely chiefly on the submarine as a naval weapon."

The recent necrology of warships includes the familiar names of several veteran British battleships and a battle cruiser; namely, the *Nelson*, *Rodney*, *Queen Elizabeth*, *Valiant*, *Malaya*, *Ramillies*, *Resolution*, *Revenge*, and *Renown*.

In summary, this fiftieth edition of *Fighting Ships* is as memorable as the occasion and it is to be hoped that the editors who follow in the progressive footsteps of Jane and McMurtrie will continue the work of their worthy predecessors in an equally commendable manner.

DANGER FORWARD. By H. R. Knickerbocker, Jack Thompson, Jack Belden, Don Whitehead, A. J. Liebling, Mark Watson, Cy Peterman, Iris Carpenter, Colonel R. E. Dupuy, Drew Middleton, and Former Officers of the 1st Division, U. S. Army. Albert Love Enterprises, Atlanta, Georgia. 1947. 429 pages (including supplement) & 48 pages of photographs.

REVIEWED BY LIEUTENANT COLONEL
ROBERT C. MCGLASHAN, U. S.
MARINE CORPS

There were two famous "Firsts" in World War II. One was the First Marine Division,

victor of Guadalcanal, New Britain, Peleliu, and Okinawa. The other was the First Infantry Division, United States Army, whose command post was named "Danger Forward." Both divisions had the same professional competence, the same pride in tradition, the same esprit de corps that made them truly first in their respective theatres, feared and respected by their enemies.

Danger Forward tells the story of the memorable contribution of the First Infantry Division toward Germany's defeat in World War II; a story beginning with the night landing at Oran, Algeria, on November 8, 1942, and including most of the toughest battles of the North African, Sicilian, and European campaigns before the end in a Czechoslovakian village on May 8, 1948, the Division's 443rd day of combat. The book is not a history of the First Division in the strictest sense; it lacks documentation and contains as much editorializing as it does history. What the account lacks in historical objectivity, however, is more than made up in readability and interest. It is, as stated in the foreword, simply "the story of where the First Division went and what it did."

An unusual and most commendable feature of the book consists of a device to present both fact and background. Following a brief operational outline of the general situation of each campaign described is a factual account of the Division's operations throughout that campaign labelled "The Record." Next is a vivid eyewitness account of events and personalities of the campaign by some well-known newspaper correspondent present with the Division—this is captioned "As I Saw It." Thus the terse story from the reports and recollections of the First's officers is supplemented and rounded out by the facile words of a first-class reporter. The combination is a happy one.

The book opens with an introduction "The Fighting First" by Hanson Baldwin. He describes a quality—consciousness of tradition—which distinguishes this division from others. His analysis makes good sense to Naval and Marine readers; they, too, have found that a sense of tradition pays off in battle.

The first section treats of the North African campaigns—Algeria and Tunisia. At Oran the "Red One," as it was known, spearheaded the first of many landings in the European theatre. In retrospect the Algerian campaign seems almost a training exercise, but to the untried men of the First it was the big test—one from which they emerged with a naive, wide-eyed wonder that Yanks could fight as well as anyone else, together with pride in being the first Army division to fight in that theatre. H. R. Knickerbocker gives a good, personalized account of Algeria.

After proving itself in Tunisia and Sicily the First Division was chosen to lead the assault against Omaha Beach on the Normandy coast—and again was worthy of its tradition. Don Whitehead's excellent account of this costly landing recreates the uncertainty of those early hours when the issue was in doubt.

In the main, the book is well written and interesting. "The Record" is of more interest to veterans of the Division than to students of military operations. This reader found some of the detailed hour-by-hour account of each battalion's actions heavy going. The correspondents' "As I Saw It" is uniformly absorbing. This feature raises the book's standing from mediocre to excellent.

Danger Forward has several obvious errors, both of commission and omission. The First Division authors of "The Record" speak repeatedly of their excellent pre-war groundwork in amphibious training, which made the First practically unique among Army divisions. Nowhere is there any mention of the fact that they received their amphibious training entirely from and with the Fleet Marine Force under General Holland M. Smith, U.S.M.C. Had it not been for their hard-working apprenticeship under Smith's Marines, the First would have been as innocent of amphibious know-how as the remainder of the Army in 1942.

Apparently unaware of the amphibious facts of life is H. R. Knickerbocker, who states in his *As I Saw It* in Algeria, "The first time. The first landing. The first amphibious operation. Historians of war and staff colleges had believed that overseas operations could not succeed because they

never had succeeded . . .” Both Vandegrift of Guadalcanal and the Japanese conquerors of Malaya would have been surprised to read this claimed “first” in November of 1942, months after their own exceedingly successful amphibious operations. Further, it may have been true that Army staff colleges believed in the inevitability of amphibious failure, but this most emphatically was not true of Marine schools. The Marine Corps developed, taught, and practiced amphibious doctrine and believed in its feasibility—from one World War’s end until the second, when they demonstrated its value under fire.

Harder to understand than the First’s ingratitude to its amphibious mentors, however, is the tragic lack of any semblance of effective close air support of the First Division in Algeria, Tunisia and Sicily. It was not until the landing on Omaha Beach that the oft-bombed doughboys could feel that the Army Air Force was on their side. In Tunisia the P-38’s appeared—to bomb and strafe our infantrymen. Again in Sicily American planes bombed American troops and we read, “It was one of the penalties of close air support as the Division knew it in those days.” These and far too many other instances of complete lack of air-ground coordination were occurring months after the Marines on Guadalcanal had enjoyed the fruits of real close air support by Marine Corps and Naval aviation. The inescapable fact is that the Army’s air arm couldn’t help the infantry because their aviators didn’t know how—they didn’t (and don’t today) recognize the value of close air support. Fortunately in most instances artillery was able to perform the mission; it was willing and knew how.

The best feature of the book’s format is big, easy-to-read type. Most obvious deficiency is the lack of sufficient, properly placed maps to clarify the sometimes obscure maneuverings of the units. Also, the photographs would have more appeal if distributed throughout the text rather than lumped together at the end.

For those who, like this reader, spent most of the war in the Pacific area, this book offers an authentic, detailed picture of the German war. For every reader it provides an exciting story of the most tradition-proud division of

the U. S. Army, one which Marines can well accept eye-to-eye as fine soldiers and old comrades.

Thumbnail Reviews

Dictionary Of Guided Missile Terms. By the Committee on Guided Missiles of the Research and Development Board of the National Military Establishment. Issued in cooperation with *The Antiaircraft Journal*. Washington, D. C.: Public Affairs Press. 1949. 57 pages. \$2.00.

Defining such terms as bang-bang, back-scattering, downwash, balladromic, beeper, mach number, loran, schlieren, scopodromic, entropy, servo-system, dihedral, and emissivity, this concise little publication is sampling the rare atmosphere to which Webster has not yet aspired. Up-to-date, accurate, authoritative, it fills a definite need of the day.

Basic Refrigeration and Air Conditioning. By Robert Henderson Emerick. New York: Prentice-Hall, Inc., 1948. 259 pages. \$5.00.

Originally developed for training a large force of men of various trades who were called upon to do installation and repair work with refrigeration and air-cooling machinery at the Pearl Harbor Navy Yard during World War II, this book is primarily a text for those who wish to have professional training in the subject.

Equipped with a good index, a bibliography, and sound practical advice, the volume is a thorough, straight-forward, well-organized exposition.

The Articles of War. Annotated. By Lee S. Tillotson. Harrisburg, Pa.: The Military Service Publishing Company. 1949. 408 pages. \$3.00.

This is the fifth revised edition of Colonel Tillotson’s explication of the Articles of War, including all changes to February 1, 1949. The volume should be on the reference shelf of every officer whose duty or interests are directly concerned with naval and military law.

Psychiatry for the Millions. By Benzion Liber. New York: Frederick Fell, Inc. 1949. 307 pages. \$2.95.

Although the author of this popularization is director of the New York Mental Hygiene Clinic at Polyclinic Hospital, the book is neither thorough enough for the serious adult reader nor an intelligent presentation for a wide popular audience.



Official U. S. Navy Photograph

NAVY HELICOPTER LANDING ON THE FORWARD TURRET OF THE BATTLESHIP *MISSOURI*

Now the Marines, experts at amphibious warfare, have demonstrated that they can use helicopters instead of boats to get troops ashore in a beachhead assault.



THROUGH 23 MAY 1949

UNITED STATES.....	836
James Forrestal—Marines Land in Helicopters—Navy Rocket— Missiles Range in Caribbean—A Navy Is Vital	
GREAT BRITAIN.....	837
Staff Exercise—Fleet Summer Program—Atomic Target—Scrap <i>Ajax—Amethyst</i> —British Fleet	
FRANCE.....	841
Ship Trials—Surplus Sales	
U.S.S.R.....	842
May Day Show	
AVIATION.....	842
Fighter Designers Challenge B-36—New Fighter Design Needs—Air Groups Barely Sufficient—Supermarine 510—Meteors for Belgium	
MERCHANT MARINE.....	847
Superliner Date Advanced—S.S. <i>LaGuardia</i>	
MISCELLANEOUS.....	847
Reflection on a U. S. General Staff	

UNITED STATES

James Forrestal

N. Y. *Herald Tribune*, May 23 Editorial.—The tragedy which has ended the career of James Forrestal, former Secretary of Defense, and one of the ablest and most selfless administrators whom this country has ever enlisted in its service, was the result of overwork, over-conscientiousness, the overstrain which our times have put on every able man with a deep sense of duty, and the almost juvenile savagery with which such men are too often treated by the partisans and sensation-mongers of our public life.

As the President said yesterday, Mr. Forrestal was in a true sense a "casualty of the war"—of that war which made as enormous demands upon the top administrators, carrying their terrible responsibility for the adequate equipment and proper employment of the millions relying on them, as it did on the individual foxhole soldier or combat pilot who lived or died according to the energy and skill of their administrative supporters. Working fourteen hours a day, seven days a week and without vacation, Mr. Forrestal drove to completion the ships and landing craft, the vast organization and mountains of supplies which were the tools of victory and survival; but a strain of that kind can leave wounds which are incurable.

Yet it was not only the war. The strain was unrelieved as the gigantic tasks of peacetime military reorganization were pressed upon him; and it had to be borne in a new atmosphere of petty jealousies, rivalries, political bickering and back-biting, factional and journalistic snipings. There are many public men who seem to thrive on partisan battle and on the grist of insult and misrepresentation which is the normal reward of eminence in American public life; but such men are not always, by any means, the ablest administrators or the finest or most conscientious minds in the public service.

Mr. Forrestal had the grim jaw, the tense self-discipline, of the fighter; but he was a fighter for what principle and duty demanded, not for himself. He was doing to the best of his great capacities an extraordinarily difficult job of reorganization, administrative planning, the reconciliation of violent

opposites; he was doing it with inadequate powers and inadequate public understanding and support, and was without sufficient defenses against either the exhaustion to which his own labor had reduced him or the meannesses of the keyhole world of Washington. It is possible to put a breaking strain upon the strongest, and Mr. Forrestal broke. But the loss is the nation's; and the question it leaves behind it—as to whether as a nation we can always afford the cruel luxury of the treatment we so often mete out to our most devoted public servants—is not easily to be evaded.

Marines Land in Helicopters

N. Y. *Herald Tribune*, May 11.—Quantico Marine Base.—Marines used helicopters instead of boats Monday in demonstrating a new technique to get troops ashore in a beachhead assault.

With a simulated flight deck for take-off and a realistic battlefield for landing, they demonstrated to about sixty members of Congress Monday that the trick was both feasible and practicable.

Congress has been hearing suggestions lately that perhaps Marine troops should be turned over to the Army and Marine aviation to the Navy. The Marine Corps invited the Senators and Representatives, most of whom were former Marines, to come down to this big base to see the demonstration. It was a rehearsal for forthcoming amphibious exercises off the Carolina coast when the helicopter troop transports will be flown off the 14,500-ton carrier *Palau*.

In offering this new scheme for getting the first assault forces ashore in enemy territory without subjecting them to murderous fire from fixed positions along the beach, the Marine Corps has two major points in mind:

1. Reducing the hazard of an enemy atomic bomb attack on the close formations of transport vessels necessary in conventional amphibious landings.

2. Putting troops down at any point desired, whatever the terrain, with the consequent advantages of surprise.

Navy Rocket Hits 2,250 Miles Speed

N. Y. *Herald Tribune*, May 4.—The Navy's new experimental rocket, a forty-

five-foot-long Viking, reached a speed of 2,250 miles an hour and an altitude of fifty-one and a half miles today on its first launching.

The rocket was launched thirty miles north of the southern boundary of the White Sands, N. M., proving grounds, and landed ten miles to the northwest five minutes later, a Navy announcement said.

The altitude was far short of the 114-mile height reached by a German V-2 in Army tests, and the 250-mile record set by a two-stage V-2, combined with a "WAC Corporal" rocket.

The Viking, similar to the V-2, was developed by the Navy to carry scientific instruments beyond the earth's atmosphere for research in cosmic rays, atmospheric composition, radio propagation and photography.

Missiles Range in Caribbean

Manchester Guardian, May 4.—Washington. The State Department announced today that Britain and the United States are negotiating for a joint guided-missiles range in the Caribbean area. "Good progress is being made," a spokesman said.

The project, designed to track the flight of missiles, involved setting up launching sites in Florida and constructing radar tracking stations in the Bahamas, he added.

Yesterday the United States Senate approved legislation to set up a 3,000-mile testing range to cost £50,000,000.

A Navy is Vital

N. Y. Times, May 6.—The interdependence of the armed services and particularly airpower's reliance on the Navy for advanced bases from which to wage an offensive war were stressed last night by Rear Admiral W. S. DeLany in an address here. Admiral DeLany, Commandant of the Third Naval District, spoke to a rally of the state Navy Mother Clubs at the New Yorker Hotel.

Admiral DeLany asserted that security against attack can be achieved only by denying potential enemies the base areas from which attacks could be launched.

"Atomic weapons, guided missiles, push-

button contraptions in no way weaken that principle," he said. "The increased range and deadliness of such weapons merely accentuates the necessity for plans and over-all Navy strength, adequate for immediate advancement of our forward lines of resistance and offense."

Calling the United States essentially a maritime nation, Admiral DeLany said that "seapower, therefore, plays the most important part in its security." Seapower, he asserted, can control 70 per cent of the earth's surface. He added:

"Regardless of the development of air, even if the day comes when commerce is transported by air, there will be ships upon the surface of the sea to supply such air bases and to serve them."

Admiral DeLany declared that "if we accept a defensive concept for the Navy, and our national security, we admit failure and admit that we have elected to fight any future wars on our own soil."

GREAT BRITAIN

Staff Sea Warfare Exercise

London Times, April 21.—The First Sea Lord, Admiral of the Fleet, Lord Fraser, yesterday received representatives of the Press at Greenwich and expounded to them the nature and purpose of the comprehensive "Exercise Trident," which is being conducted there during next week.

The purpose of the exercise is to examine all aspects of warfare at sea—past, present, and future—with a view to emphasizing the continued vital importance to this country of maintaining sea communications in war and of intimate collaboration between the different services, as well as the impact of these matters on other departments of Government. It is being attended not only by many naval officers of high rank holding important appointments—many of the commanders-in-chief of the Navy's foreign stations are at home in order to take part—but also by Ministers of the Crown, senior Civil servants, prominent men of science, officers of the Royal Naval Reserve, American officers and others.

Lord Fraser, in welcoming the Press representatives to the scene of the exercise, ex-



Official U. S. Navy Photograph

WHEN WARSHIPS WERE CHEAPER

The pre-war built U. S. Cruiser *Indianapolis*. Nowadays the electric installation of a cruiser costs five times what it did in 1938, and the armament of a destroyer has gone up to ten times the pre-war cost.

plained that since much of it would be concerned with matters that are secret, it was not possible for them to be admitted to the exercise itself; but that two specimens of its procedure would be shown to them as illustrating the whole. The exercise was of a purely "staff" character, not involving the actual movement or participation of ships. It was in no sense aggressive, very much the reverse: it was rather a matter of examining possible dangers and taking precautions against them.

Starting with lessons learnt during the late war, the programme was designed to direct attention on to the conduct of analogous operations in the immediate future—if such need should arise—and lead on to scientific development to be expected in the future, eventually touching on the effects of atomic development on war at sea.

Each item would be staged as a lecture,

demonstration, or conference, and would be followed by a discussion of the issues raised or illustrated. Among the subjects to be studied would be the strategic effects of the world distribution of raw materials, including fuel; shipping and its defence, both in the last war and against the air and submarine attacks to be expected in the future; the tactical application of new weapons, such as guided missiles, jet aircraft, and rockets. Various devices would be used to display the desired subjects—cinema films, models, and the like.

RISING COSTS

Lord Fraser spoke on the subject which exercises many minds, the re-equipment of the services, and the slow progress that is seemingly being made in that task, so vital to security. Besides the rapid developments that are now in progress, which dictate care

not to expend resources on new equipment that would be obsolete by the time it is provided, there is the heavy increase in all manufacturing costs, which equally dictate a husbanding of resources.

The armament of a destroyer of to-day, for instance, costs 10 times that of her predecessor of 1938; the electrical installation of a modern cruiser is five times as elaborate as that of her predecessor of the same date, and correspondingly more costly.

The demonstrations which followed took place in "Trident Hall," specially fitted up in a war-wrecked garage just outside the gates of the Royal Naval College. The first demonstration took the form of a lecture on the course of the war in the Mediterranean during 1941 and 1942, specially designed to illustrate the interdependence—on both sides, Axis as well as British—of the sea, land, and air arms. The possibility of using Malta as an operational base, for instance, was shown to depend upon the number of fighter aircraft provided for its defence against the attacks of the *Luftwaffe*; when its defence was effective enough for cruisers and destroyers to operate there, the proportion of Rommel's supplies that got through to Africa dropped sharply, and he was unable to advance or to hold advanced positions.

The second item was a demonstration of the tasks involved in the passage of an east-bound Atlantic convoy in 1943, as a prelude to the similar problems of the immediate future when shipping may have to withstand the attacks of high-speed submarines as well as the improved aircraft of to-day.

The audience was shown the convoy disposition by model ships on the floor of the arena, by which they saw how the formation of the ships forming it left a clear space in the middle for the escort aircraft-carrier to manoeuvre.

Home Fleet Summer Program

London *Times*, May 4.—The Admiralty yesterday issued an outline of the summer programme of the Home Fleet—which seems to have shrunk slightly since its cruise to the West Indies last autumn.

The Commander-in-Chief, Admiral Sir Rhoderick McGrigor, has shifted his flag to the aircraft-carrier *Implacable* while his late

flagship, the battleship *Duke of York*, is being refitted. Only one carrier of the 3rd Aircraft Carrier Squadron, Rear-Admiral Mansergh's flagship, the *Theseus*, is to take part. As before, there will be three cruisers of the 2nd Cruiser Squadron, in command of which Rear-Admiral Slayter has relieved Vice-Admiral Russell. Twelve destroyers, all of the new "*Battle*" and "*Weapon*" classes, will take part.

The whole fleet—as thus summarized—is to spend a month based on Invergordon, for exercises; ships will then visit various foreign ports before the end of June, when exercises with ships of war from other nations of the Western Union are to take place. Before and after those exercises visits will be paid by different ships to various ports and seaside resorts in the British Isles.

Arethusa as Atomic Target

London *Times*, April 29.—The cruiser *Arethusa* was moored off the Sussex coast to-day about four miles east of the Nab Tower, Isle of Wight, where she will be used as a target to test the effect of atomic (gamma) rays on her hull in a series of experiments which begin next week. The rays will be directed upon the *Arethusa* from pontoons, and their effect on the ship will be recorded by instruments installed in her. There will be no men and no live animals in the ship.

The area near the cruiser has been notified as a danger area to all shipping, and private vessels will not be allowed within half a mile of her. The *Arethusa* was built at Chatham in 1935.

Scrap Ajax

London *Times*, April 7.—It was announced in the House of Commons to-day that it has been decided not to sell H.M.S. *Ajax* to any foreign country.

Mr. Dugdale, Parliamentary Secretary to the Admiralty, said that the Government had given the matter careful consideration. They were conscious of the very cordial relations which had existed between the British and Chilean navies over a long period, but, nevertheless, had decided that this ship, which had played such a historic role in British naval history, should not be sold to any foreign Power. (Loud cheers.) As the

Navy had no further use for her she would, of course, have to be scrapped.

Mr. J. P. L. Thomas (Hereford, C.).—Is the Parliamentary Secretary aware how gratified the country will be at the decision that this historic ship should not be sold to a country at the moment in possession of British territory?

Vice-Admiral Taylor (Paddington, S. C.).—Instead of scrapping this ship which carried out such illustrious service would it not be possible to turn her over to one of the Dominions?

Mr. Dugdale.—That is a question which should be addressed to the Secretary of State for Commonwealth Relations.

Amethyst Unprotected

The Aeroplane, April 29.—On April 20, H.M.S. "*Amethyst*," a 1,490-ton frigate of the Far East Fleet, was fired on and hit by shells from a shore battery of the Chinese Communist forces on the North bank of the Yangtse River. Casualties on the "*Amethyst*" were 17 killed and 23 wounded; she was driven ashore but later was refloated and anchored upstream.

At the time of the shelling, H.M.S. "*Amethyst*" was going up the Yangtse from Shanghai to Nanking to relieve the destroyer H.M.S. "*Consort*." The latter went to her relief's rescue and was also hit by shells, suffering some casualties, before returning to Shanghai.

On April 21, the cruiser H.M.S. "*London*," accompanied by the frigate H.M.S. "*Black Swan*," made an unsuccessful attempt to rescue "*Amethyst*"; other ships were also fired on and severely damaged.

Later in the day an R.A.F. Sunderland dropped supplies and subsequently put a

party of four, including two doctors, aboard the beleaguered ship. Subsequent attempts to alight alongside were driven off.

We record the affair, not because of the publicity which has already been given it but because someone in authority already seems to have forgotten that to-day ships without air power to shield and protect them are a waste of public money. Once again many lives have been lost and a costly ship endangered because the lesson has been forgotten.

(EDITOR'S NOTE: An indignant letter to the *London Times* claimed that sufficient bombing to cover these ships would have started outright warfare.)

Comments on British Navy

N. Y. *Times*, May 8.—By Hanson W. Baldwin.—The British Navy estimates for 1949-50 indicate that the trend toward increased readiness that started with the war scares last year will continue, but "vigorous" research and development will be pushed. The navy, alone of the three British fighting services, will be increased very slightly in man-power in the next fiscal year. The approximate present and planned manpower of the three British armed services are:

	April 1, 1949.	Mar. 31, 1950.
Navy.....	145,000	146,000
Army.....	416,000	391,000
Air Force.....	232,000	213,000
Total.....	793,000	750,000

The official naval estimates show that Britain now has a sizable fleet in active operation, including two battleships (compared to our one) and five carriers. The following table gives the status of the principal vessels of the British Fleet:

Type	Active Fleet	Training Experimental Etc.	Reserve Fleet	Under Construct'n
Battleships.....	Duke of York Vanguard	Anson King George V Howe	—	—
Carriers..... (All types)	Implacable Ocean Triumph Vengeance Theseus	Victorious Illustrious Warrior Glory	Indefatigable Formidable Indomitable Campania	10
Cruisers.....	15	2	12	3
Destroyers.....	33	20	65	3
Submarines.....	30	4	31	—

Thus, the British navy, which was reduced immediately after the war to perhaps its lowest ebb in more than a century, has now become once again a formidable factor in world power.

ON POLITICIANS AND ADMIRALS

Exactly what part it will play in the future is dependent not alone upon the politicians but upon the admirals who control its destinies.

Anthony Martienssen, author of "Hitler and His Admirals," has some interesting comments to make on this subject in a letter to this writer. Mr. Martienssen writes that some critics who have read his book have argued that if Grand Adm. Erich Raeder had "played a bigger part in the Nazi political . . . set-up he would have been able to obtain better facilities and larger appropriations for the Navy. . . ."

"Most of the admirals in the Royal Navy (N. B.—also in the United States Navy) have played at politics at some time or other," Mr. Martienssen comments, "and it is true that by their influence on politicians in the past they have managed to keep the Royal Navy up to scratch. The recent appointment of Admiral Lord Fraser as First Sea Lord is directly in line with this policy. He is a man whose political sense is acutely developed and whose personality is finely tuned to the need to influence Labor MP's of the importance of sea power.

"But in my heart of hearts, I'm not sure that this is right," Mr. Martienssen writes. "The navy, like the other services, must be the instrument of policy and not the director. If the admirals get too big a say in politics, they are liable to twist policy to fit the navy rather than vice versa. On the other hand, in England now, as in America and as it was in Germany before the war, few politicians have any real idea of what sea power is and why it should be maintained. If the admirals don't get on their hind legs and shout, who will? It's a perplexing problem. . . ."

FRANCE

Ship Trials

La Revue Maritime, March 1949.—The permanent commission for trials of ships of

the fleet, recently reorganized and presided over by Rear Admiral Graziani, has been active during the past 3 months, supervising the trials of the battleship *Jean-Bart*, the *Châteaurenault*, the *Jurien-de-la-Gravière*, the *Lorrain*, and the *Alsacien*.

Following her performances of the preceding month, the *Jean-Bart* carried out, on February 7th and 8th, trials in speed, fuel consumption, and gunnery. At the base of Glénans, despite strong wind and rough seas, she made a speed trial under full steam, during which she exceeded 32 knots at 175,000 H.P. She then returned to Brest for routine checking.

Surplus Sales Pay For Indo-China Campaign

Chicago Tribune, May 20.—Paris, France.—The vast terrain used for army maneuvers will be rented to farmers for crops and the wide fortified belt of the Maginot line will be leased to hunters to shoot rabbits, boars, and partridges in a desperate effort to raise funds for French military operations in Indo-China.

Thousands of tons of antiquated and obsolete military equipment which has been accumulating in barracks, forts, and army warehouses since Napoleon's time will be auctioned, and scores of properties scattered over the country sold to raise funds and reduce personnel.

Paul Ramadier, minister of national defense, expects to raise 20 billion francs (\$65,000,000) by the economy campaign and thus defray the costs of sending reinforcements of 10,000 troops to fight the Viet Nam.

The sportsmen will pay \$30 for hunting licenses to shoot game in the hundreds of thousands of acres now embraced in the fortified zones and the peasants will pay \$20 a year per acre to cultivate fields and plains.

Ramadier will move the artillery proving grounds to North Africa and rent the fields previously used for that purpose to farmers. He will also demilitarize certain army airports and place military aviation on the commercial air fields.

French authorities expect the projected American military lend-lease as an adjunct to the North Atlantic pact will supply them

with brand new equipment free to replace material they plan to junk.

The supplies include millions of World War I tin hats, hundreds of thousands of pairs of rotting shoes, hundreds of thousands of moth eaten uniforms, scores of batteries of rusted field kitchens, saddles and harnesses of former cavalry units, including the flashy equipment of the Hussars and Dragoons, and thousands of decrepit old trucks, wagons, vans, and other vehicles, and huge supplies of worthless apparatus from the engineer corps.

U.S.S.R.

May Day Show Presents Jets

N. Y. *Times*, May 1.—Moscow.—A spectacular display of Soviet jet aircraft, including a new MIG that Radio Moscow described as "the fastest plane in the world," marked impressive May Day ceremonies in Red Square.

Generalissimo Stalin and members of the Politburo watched the air show, which was under the command of Maj. Gen. Vassily Stalin, the Generalissimo's son. Premier Stalin, in a gray uniform, looked vigorous and fit.

The Red Square demonstration brought the first glimpse of the improved MIG type jet plane. Radio Moscow said this was Soviet Union's newest model and that its speed was superior to any other aircraft.

Three types of jets were included in the review. The first two previously had been seen at the Soviet Aviation Day show last summer. The final flight of thirty jet planes, however, was the improved MIG model, with the same silhouette as the earlier version but appearing to have a higher tail and more slender fuselage.

Foreign air attachés said that, assuming Soviet jet motors equal their design, they were undoubtedly supersonic. Radio Moscow's assertion that the plane was the world's fastest would mean supersonic speed since United States and British jet planes have exceeded the speed of sound.

The Soviet jets flew over the reviewing stand well throttled down to maintain tight flight formation. Foreign air attachés estimated the speed, as the planes passed the reviewing stand, at around 450 miles-per-hour,

explaining that it was virtually impossible to engage in close formation flying at higher speeds.

United States air experts expressed the view that the Soviet Air Force was making considerable progress in the jet field. The new Soviet jets were noticeably faster than the older models. The air display included ten four-engined plane medium bombers.

HUGE PARADE REVIEWED

The display of military units started promptly at 10 A.M. and lasted about an hour. It was followed by a procession of hundreds of thousands of Moscow workers and sports club members, bearing the traditional red banners as well as the blue flags of the sports groups.

Defense Minister Marshal A. M. Vassilevsky issued the order of the day and took the salute of the parade, which was commanded by Marshal Kyril Meretzkov.

AVIATION

Fighter Designers to Challenge B-36

N. Y. *Times*, May 17.—There are at least four Air Force fighter planes and an equal number under development for the Navy that may be able to meet demands for something to intercept the B-36 bomber at altitudes over 40,000 feet, it was declared here yesterday.

So confident are builders of Navy aircraft in this area that their craft can "take" the B-36 that they will press the Air Force at the conference, called to discuss the problem on Thursday in the Pentagon Building in Washington, to let them try interception at such altitudes with the new Vought Corsair of United Aircraft, the Grumman F8F and its jet sister, the Panther, the McDonnell Banshee and several other types not now in mass production.

Most manufacturers agree that the altitude now accepted for long-range bombers—on the assumption that any enemy bomber that can reach the United States will use the same altitude—is well above the tactical requirements on which current fighter types were conceived.

Improvement in the performance of jets in proportion to altitude was a part of those con-



Official U. S. Navy Photograph

LAUNCHING A PHANTOM JET FIGHTER FROM A NAVY CARRIER

Expert aircraft builders claim that this plane or three other Navy carrier planes could intercept and "take" the giant B-36 high altitude bomber.

ceptions. Now it has been found that from 35,000 feet up, they lose surprisingly in efficiency and the propeller-driving, reciprocating engine makes comparable gains.

"SONIC WALL" LOSES MENACE

Likewise, all the fighters in service were designed before the "sonic wall" had been breached. With the results of flights "hundreds of miles faster than the speed of sound" already announced by W. Stuart Symington, Secretary of the Air Force, designers have learned either that there is no sonic wall or that they know how to pierce it without damage to their aircraft.

It is along these lines that production of new planes will be proposed. Both Lockheed and Republic have versions of the Shooting

Star and the Thunderjet with swept-back wings. They are known as the F-90 and a new model of the F-84.

In addition to the sweep-back of the wings, probably sharper than present practice, noses will be tapered to needlepoint and air-intake ducts will be flush with the fuselage.

North American, whose F-86 with swept-back wings already holds the world's speed record at 670-plus miles an hour, is proposing a refinement with flush air-intakes and a needle nose to be known as the F-93.

New Fighter Designs Needed

Aviation Week, May 16.—U. S. Air Force fighter development is lagging from three to five years behind current bomber performance.

This has dropped a critical problem in the lap of the aircraft industry:

To close the gap between fighter and bomber performance before foreign bomber development matches present U. S. standards.

Design Race.—U. S. Air Force has called a conference of all major airframe manufacturers to meet May 20 at the Pentagon, which will begin a concerted attack on this problem. From the design competitions originated at this conference will come a new breed of fighters that will eventually get the bulk of USAF fighter procurement funds.

Key factor in the new emphasis on USAF fighter development is performance of the latest models of the Convair B-36 bomber (*Aviation Week*, Mar. 14) that boosted the air war above 40,000 ft. about three years sooner than USAF strategists anticipated.

Requirements Boosted.—Until recently USAF fighter requirements were aimed at maximum performance around 35,000 ft. Although the present operational crop of USAF jet fighters (F-80 and F-94) can meet that requirement, the urgent need now is for a fighter that can reach its peak performance between 40,000 and 50,000 ft.

USAF fighter experts believe that the problems of defensive operations between 35,000 and 45,000 ft. will be tougher to solve than the entire previous climb from sea level to 35,000 ft.

Basic Problems.—The job of producing a 50,000 ft. fighter involves four basic problems:

Improvement of airframe design to permit transonic combat performance.

Redesign of turbojet engines to produce greater efficiency above 40,000 ft.

Design and production of an entire series of new accessories aimed at making navigation, control, and gunnery accurate and simple at the speeds and altitudes required.

Planning and organizing a new type of ground fighter control system based on the tremendous increase in airspace cubage brought about by the extension of air operations to the 50,000 ft. level and transonic speeds.

Basic design limitation on present type jet fighters above 40,000 ft. evolves from the high wing loading of current fighters. Fight-

ers that can take up to 7G stresses at 20,000 ft. will pull off their wings in $2\frac{1}{2}$ G turns in the thin atmosphere above 40,000 ft. USAF planners say that considerable basic research is required on the relations of wing loadings and power loadings above 40,000 ft. before much practical progress can be made on this problem.

RAF Tests.—Royal Air Force tests were made above 40,000 ft. with two Vampire jet fighters, one flying straight and level while the other tried to make passes at it. The attacking Vampire stalled and spun out every time a turn or even moderate bank was attempted.

This is basically the same difficulty encountered by highly wing-loaded fighters attempting to maneuver above 40,000 ft. against a lower wing loaded bomber flying straight and level. In an altitude record climb to 59,000 ft. by another RAF Vampire it was necessary to add six feet to the wing length to decrease the wing loading so that the plane would fly as high as its power would take it.

Need Research.—Lacking the basic research on aircraft performance and general conditions above 40,000 ft. USAF is proceeding cautiously into this new area. No really new fighter prototype contracts have been let since 1946.

Exploration of radical design change is proceeding through use of special research aircraft of which Convair Model 7002 (aimed at exploring the delta wing) and Republic XF-91 (aimed at getting data on the inversely tapered wing) are typical. Other flight research is being conducted by the Bell X-1 and Douglas D-558-I and II. Until sufficient data are gathered from these and other high speed research planes now flying, the fighter design trend will continue to be evolutionary and represent moderate rather than substantial progress.

Design Trends.—Among design trends in the evolutionary progress of existing fighter prototypes:

Elimination of the open air-intake nose and substitution of a sharp-pointed nose.

Substitution of flush air inlets for jet engines replacing nose and wing-root ducts now in use.

Increased sweepback of wings from the current 35–45 degrees to as much as 60 de-

gress merging into delta wing configurations.

Principal powerplant problem is licking for the turbojet the same basic problem encountered in getting satisfactory performance at altitude from piston engines—ramming enough thin air into the engine to support combustion and provide cooling.

Power Drop.—The best of current U. S. jet engines experience a power loss of up to 80 per cent above 40,000 ft. USAF is pinning its hopes for solving this problem on a high density flow jet engine now under development.

Aircraft equipment and ground control problems are best illustrated by the experience of USAF fighter pilots, all with considerable World War II combat experience, who recently attempted interception of a B-36 at 43,000 ft. over Muroc AFB. They were flying F-86As, probably the highest performing production fighter turned out by a U. S. manufacturer, yet it did not make effective attacks on the B-36 at that altitude except from the tail zone.

Canopies Frost.—First the cockpit canopies frosted at 40,000 ft., cutting off visibility. That problem has since been solved. Another minor irritation was that when pilots twisted their heads sharply to keep the bomber in sight during maneuvers, their oxygen masks twisted loose, causing them to suffer severe blackouts.

The F-86A has a sufficiently fast rate of climb to get above the B-36 well within the limits imposed by present early warning radar. However, without detailed ground control, pilots were unable to plot accurate interception courses during climb despite perfect visibility conditions and clearly defined bomber contrails.

Wide Turns.—When making anything but tail passes the F-86As were restricted to shallow turns of 6 to 8 mi. radius. This meant that pilots had to line up for their passes on the B-36 at from 15 to 20 miles away. They were unable to judge course and speeds properly at that distance. Consequently the fighter attacks were wide of the bomber.

USAF planners believe that these critical interception problems will mean an increasingly important role for ground controllers who will be electronically equipped to make these computations for the pilot and accu-

rately direct fighter planes in the air. It also means a revolution in aircraft armament and sighting equipment.

Air Groups Barely Sufficient

N. Y. *Times*, May 2.—Indianapolis.—Gen. Hoyt S. Vandenberg, Air Force Chief of Staff, said tonight that a forty-eight-group air armada could do no more than guarantee “prevention of an early defeat” and bring hope of “eventual” victory.

In a speech at the American Legion’s thirteenth National Aerial Roundup Banquet, he said that military officials “hope and trust this will be a sufficient deterrent to prevent a conflict.”

President Truman’s military budget for fiscal 1950 provides for only forty-eight air groups. Under orders for economy, the Air Force has been cutting back from the fifty-nine groups it had on Jan. 1 to get down to forty-eight groups by about July 1.

General Vandenberg revealed that Air Force plans called for fourteen of the forty-eight groups to be strategic bomber outfits, including four equipped with B-36’s—the world’s largest bombers. But he denied belief that a large fleet of long-range strategic bombers like the B-36, carrying atomic bombs, could win a war unassisted.

American strategic air power is “primarily a deterrent to war and a means of quick retaliation against aggressors,” he said.

“If conflict were forced upon us our strategic [bomber] force would pass from the role of deterrent to that of heavy retaliation. Our insurance against defeat and our hope of future victory would depend in large measure upon the effectiveness of this attack.”

Congress may give the Air Force more money than President Truman asked for it. The House has approved an increase to provide for fifty-seven air groups, but the bill has not been acted on in the Senate. Defense Secretary Louis Johnson has not yet made a clear statement on what size air force he favors.

Before Mr. Truman ordered a cut, the Air Force goal was seventy groups. Air Force leaders said that was the bare minimum needed for national security at present.

Despite the planned cutback, B-36 groups

are being increased from two to four, with thirty planes in each. Two strategic reconnaissance groups of RB-36's are being added to four groups equipped with RB-29's.

Other strategic bomber groups will have World War II Superfortresses and the improved versions, the B-50's, until jet bombers are developed to replace them.

General Vandenberg said that the controversial B-36 is a "capable performer," but he did not make the sweeping claims for it that others have in recent months.

"It is by no means the solution to all our security problems," he said. "The Air Force has never held that this airplane is a suitable basket for all our eggs."

He said that some day all airplanes like the B-36 might be outmoded by pilotless, guided missiles. But long before then, he went on, the B-36 will be replaced by better strategic bombers. He said that the first replacement for the B-36 already was being designed but would not be produced for "several years."

The Supermarine 510

The Aeroplane, April 29.—First pictures of the swept-wing Supermarine 510 show that this is the first British aircraft with swept main and tail surfaces. Based on the Attacker Naval interceptor, the Supermarine 510 is powered by a Rolls-Royce Nene jet engine of which the new variants give 5,500 lb. S.T. The span is 31 ft. 8½ ins. and the length 38 ft.

The maker's announcement states that the aircraft is to be used for high subsonic and supersonic research. Experience has shown that the best altitude for conventional jet aircraft to conduct supersonic flights is at a starting altitude of about 40,000 ft. and pulling out not lower than 30,000 ft. Speeds of 700 m.p.h. reached at say 35,000 ft. exceed the local speed of sound, but we do not know what the performance of the 510 at this height may be, or what the angle of dive necessary to reach Mach 1.0 will be.

The Supermarine 510 has already flown in the hands of the Company's test pilot, Mr. Michael J. Lithgow. It seems probable that the unusually good flying controls of the Attacker will also be retained on the 510. The Attacker was quickly developed after the War by using many Spiteful parts—the main

planes and undercarriage were substantially the same. The 510, although far removed from the Spiteful, also embodies experience gained with the Attacker. This includes such assemblies as cockpit design, fuel-tank arrangement, plenum chamber layout and cabin pressure equipment.

The 510 has a mainplane sweepback of about 45 degrees and the tail surfaces are swept more. The intake has not, externally, been changed much and the engine compartment is likely also to be the same as the Attacker. The Attacker F.1 is in production for the Royal Navy and is an airframe which is particularly suitable for the French, as it would lend itself to installation of their Hispano-Suiza Nenes. The 510 is a logical development of the Attacker and holds promise of being a very fast fighter which could have a creditable range and endurance with drop tanks.

Meteors for Belgium

The Aeroplane, April 29.—Quantity delivery of Gloster Meteor 4 and Meteor 7 trainers is to begin immediately, following successful negotiations for the supply of Meteors to the Belgian Air Force.

This, therefore, is another step in standardizing, among Western Union countries, air defence equipment, and the two designs which form the basis of the European effort are the Meteor and Vampire. The Belgians are expected to build Derwent 5 turbines under licence and these power units will be used in Fokker-built Meteor airframes (which may be sold to Belgium) and will be a source of engine spares for the British-made aircraft which their country is now to get.

These two famous British fighter designs appear to be ageless, but in fact they are continually being refined as experience, operating them under all conditions, grows. In its latest form, Gloster have used a long-nosed single-seat version and it seems possible that the Mk.8—latest variant of the basic design—represents a line drawn across the latest equipment modifications.

The Belgians will receive the most up-to-date Mk.4s, but it seems probable that the Dutch will build an aircraft which will anticipate changes in the Meteor now being developed at Gloster's.

MERCHANT MARINE

Superliner Completion Date Advanced

N. Y. *Times*, May 16.—An accelerated construction program cutting four months from the building time of the new superliner for the United States Lines will enable the ship to go into service in time for the 1952 summer tourist season, an official of the Newport News Shipbuilding and Drydock Company, the builder, disclosed today.

At the request of John M. Franklin, president of the line, the shipyard revised its timetables to permit delivery of the proposed challenger for the Atlantic "blue ribbon" on April 3, 1952, instead of Aug. 7 of that year, the date specified in the yard's contract signed last week.

The keel of the \$70,000,000 vessel will be laid on or about Feb. 6, 1950, according to the builder's spokesman. April 5, 1951, has been set as the launching date.

Thus, construction time for the 48,000-ton vessel would be only twenty-seven months—remarkably short, according to shipping men considering that the 26,454-ton *America* required the same period. The *America*, largest passenger liner previously built in this country but half the tonnage of the new ship, also was a product of the Newport News Company.

The construction time for other superliners such as the *Normandie* and *Queen Elizabeth* was as much as twice as long, it was noted.

The new liner, which may be named the *United States*, is known to her builders simply as Hull 488. She will be the first quadruple-screw passenger liner built in this country and the first potential American speed queen since the Nineteenth Century.

S.S. La Guardia

N. Y. *Times*, May 16.—Mobile, Ala., May 9.—Ready for her new service between New York and Mediterranean ports, the refurbished liner *La Guardia* sailed early this afternoon from the yard of the Alabama Dry Dock and Shipbuilding Company.

Gleaming in a new paint job and completely outfitted to carry more than 600 passengers, the 18,000-ton liner will be the largest American-flag ship to enter the run to

Italy. She will be operated by the American Export Lines under charter from the Maritime Commission.

A large group of Government officials, company men and guests went aboard the ship this morning for the four-day run to New York. The run will be in the nature of a shakedown trip.

The *La Guardia* is due in her home port Friday and the traditional welcome to a new ship is expected there. She is the largest addition to the American passenger fleet since the *America* came out in 1940.

FORMERLY THE RICHARDSON

The *La Guardia*, renamed in honor of the late Mayor of New York, was formerly the *Gen. W. P. Richardson*. She was a Maritime Commission design, of the P-2 class, virtually identical to the ships of the *General Meigs* class.

For more than a year she has been undergoing reconstruction at the Pascagoula, Miss., plant of the Ingalls Shipbuilding Company, and she was brought to Mobile a week ago for finishing touches in the Alabama yard. Officials of American Export Lines and the Maritime Commission have been here during the week supervising last-minute details. Complete inspection of the ship has not yet been made, and the operating officials have not said what they think of the job.

The *La Guardia* is to carry 157 passengers in first class and 452 in tourist. For the warm-weather route to Naples and Genoa she has been equipped with spacious new public rooms in both classes, forced ventilation throughout and some of the most modern and comfortable crew quarters ever offered to American seamen.

She is to run with the American Export Line's trim new *Four Aces*, and later the company will place two new 20,000-ton liners in the route. These ships, the *Independence* and *Constitution*, are now under construction.

MISCELLANEOUS

Reflection on a U. S. General Staff

Marine Corps Gazette, May 1949.—By Col. Robert Alan, USAF (Command pilot, West Point '31, presently on Joint Strategic Plans Group, Joint Staff).—Ah, the pity of

it all! Never, one is led to believe, has the high command of a nation been in such a sorry state. Observe: "The President has no military staff directly responsible to him and independent of the services." "The Joint Chiefs of Staff, being the executive heads of the Army, Navy and Air Force as well as the chief military advisers of the Commander-in-Chief, are sadly handicapped as regards to time and number of duties." "May be the Joint Chiefs of Staff could get more done if somebody cracked their heads together." "The Hoover Commission was reported weighing plans to propose a civilian chairman over the Joint Chiefs of Staff to cool off interservice rivalries." "The committee system of command tends to delay, indecision, weak compromises or inaction. This might result in disastrous delay or indecision should the interests of the services diverge during a critical military situation." "The services seem to be about as happy in their unification as a batch of tomcats tied together by their tails and tossed over a clothesline." "The frictions between the Navy and the Air Force are as sharp as before, and they bring about duplication and instances of empire-building that contribute virtually nothing to our military strength and are unduly hard on the taxpayer." "We may have a government by colonels." "The statutory authority of the Secretary of Defense should be materially strengthened." And, someone has caustically observed, we may even come to the sorry time when Mr. Eberstadt, one of the primary architects of the National Security Act who has recently reviewed his handiwork and found it good, is unavailable for further review of the National Military Establishment.

All these things and more are feared, alleged, or stated as fixed opinion—some by responsible men of adequate background and objective view, some by men whose only qualification is access to print or microphone.

There is nothing wrong in all this. It is merely the custom in our country, our way of doing things. No better way has yet been devised to insure the greatest good of the greatest number.

With this conglomeration of choice adjectives, fine invective, derisive citizens and experienced organizers, it appears that any-

one may get into the act. Congress itself will soon be giving close scrutiny to the Hoover Commission's recommendations for the reorganization of the national security organization, and doubtless the question of a United States General Staff will again be raising its perennial head. Before it does, let us give the general staff problem the objective scrutiny it deserves. A wrong decision in this matter by Congress could be disastrous.

By United States General Staff is meant all that the term has traditionally implied—a huge planning, directing, operating, administering staff complete in every detail. It would provide the authoritative coordination and unified direction under civilian control necessary for the integration of the services into an efficient team of land, naval and air forces. Among others, its fields of endeavor would encompass strategy, certain phases of administration, logistics in its fullest sense, preparation of the budget, determination of roles, missions and requirements, all types of mobilization planning, the elimination of unnecessary duplication or overlapping and the coordination of military education and training. The General Staff would absorb the functions of the Munitions Board, the Research and Development Board, and the Personnel Policies Board.

The staff would be headed by a Chief of the United States General Staff who would also be Chief of Staff to the President. He would be senior to all other officers in the Armed Services. He would have the power of decision, subject only to the higher authority of the Secretary of Defense and of the President. The Joint Chiefs of Staff would be abolished, as would the executive departments and Secretaries of the Army, Navy, and Air Force. The unmerged Army, Navy, and Air Force would then be placed in a single Department of Defense under a Secretary who had broad, clear power to manage and direct.

The officers of the United States General Staff would be drawn from the three services in equal numbers. They would form a General Staff Corps permanently separate from the officer corps of the services. In addition to manning the General Staff, they would provide the commanders and staffs of all

unified commands and joint task forces. They would wear a separate uniform and be on a separate promotion list. To insure constant touch with reality, they would serve tours of duty with the Services at frequent intervals.

Let us now examine the pros and cons of such an organization. Might it be a Frankenstein?

Before proceeding further, it should be mentioned that the staff just described is the extreme proposal for a United States General Staff. From it many recoil in horror who merely pose mild objections to the several diluted versions that have been suggested through the years. And so to the problem.

In favor of the General Staff the following arguments have been variously presented:

First, it would provide a completely objective viewpoint at the top where it is badly needed. The country deserves something better than plans based on the desires of all the services. A staff, completely divorced forever from service traditions, vested interests, rivalries and fears would produce the required product.

Second, it would eliminate the delay, compromise and frustrations which even under the urgency of war and the presence of as great and objective a personality as General Marshall, were evident on a number of occasions.

Third, in connection with the emphasis we are placing on economy and the necessity for husbanding our national resources, such a staff would be in a perfect position to effect economies. It would recognize padding quite readily, and quickly sort out the essential from the non-essential.

Fourth, it would raise those who think in terms of the over-all defense of the country to what would clearly be a separate and distinguished position in our armed forces.

Against the General Staff are these arguments:

First, it would place too much power in the hands of too few. The United States General Staff might, as did the Prussian General Staff, gradually assume control of the higher political activity of the country. 'The Man on Horseback' might arise. In this connection it will be recalled that many

times recently the military has been accused of exercising undue influence in the political realm, with Gen. Marshall as Secretary of State, Gen. Clay making policy in Europe, and Gen. MacArthur formulating it in the Far East.

Furthermore, it is said that the Chief of the General Staff would tend to become the Commander-in-Chief in his own right, that despite the Secretary of Defense and the President, his influence might become decisive and even pave the way to dictatorship. Once again the finger is pointed to the Prussian General Staff of 1860-1918, and particularly to Gen. Ludendorff who, in World War I, ran rough-shod over Chancellor Bethmann-Hollweg and Kaiser Wilhelm in the formulation of both military and foreign policy.

Second, it is alleged that the mere creation of the General Staff would not of itself assure efficiency. The task of directing all the joint activities of the three services is too tremendous for one staff and for one man, it is said. Moreover, although the Chief of Staff might act decisively, he might not do so wisely. He, too, even as the Joint Chiefs, must consider and weigh; and in this day of preference for even a bad decision over no decision at all, he might be so terribly wrong as to invite disaster.

Third, it is said that without denuding the three Services, there are not enough jointly trained and highly-skilled officers to form a great joint staff. Whereas its members should be officers of the highest intellectual attainment, superior schooling, and widest experience, the bulk of them would perforce be even as you and I—ordinary officers who might command neither the respect nor the confidence of the services.

No decision about the proposed United States General Staff can be properly made without first understanding the German General Staff. Every discussion of a United States General Staff seems to bring forth reference to the German General Staff, the mere mention of which makes the spines of most Americans tingle with fright. This reaction appears to stem partly from attendance at movies in which the Prussian officer has been represented as a monocled aristocrat of unbearable arrogance, implacable

menace and sadistic cruelty rivalled only by Dr. Fu Manchu. Surprisingly enough, history reveals that these qualities are in truth representative, and it is of them that many Americans think when they refer to the dangers of the German General Staff. What other Americans fear will be brought out later.

The German General Staff itself had much to recommend it. The living heart of it was the General Staff Corps, consisting in 1914 of about 240 highly skilled, intensively trained officers who had dedicated themselves to acquisition of the highest degree of high-level military skill. Here was no vegetating, no dullness, no stagnating; they studied the past only to learn and apply its lessons. Their view was towards the future, towards the study of the newest weapons and techniques, towards the handling of huge masses of men and their movement and supply. The greatest stress was placed upon initiative, originality and adaptability to circumstance. It is possible that no other military staff ever achieved the high standard of professional excellence attained by these officers of the General Staff Corps. Shortly before the war of 1870 the French Ambassador to Prussia wrote: "The composition of the Prussian Staff will, in the next war, constitute the most formidable element of superiority in favor of the Prussian army."

The effectiveness of German arms in the period 1860 to 1918 is attributed in no small measure to the superior mastery of the art of war by the General Staff Corps. They are represented as having acquired a tremendous capacity for work, the faculty of concentrated effort over protracted periods, and the ability to deal swiftly and effectively with multitudinous problems. Upon these characteristics of the General Staff Corps rested the magnificent efficiency of the German General Staff of which the Corps, distinguished by the broad purple stripes on its uniform, was the driving force.

No one would object to these professional attainments in an American General Staff Corps. What one would object to is any growth in American officers of the arrogant attitude of Prussian officers, and their almost universal tendency to despise civilians.

Equally objectionable and far more dangerous, however, was the fact that the German General Staff became the guiding spirit and controlling force of its country's foreign policy. It was able to do so as much because of its own excellence, as because of the weakness of Chancellors and Emperors. The last Kaiser, particularly, failed to dominate the General Staff during the first World War. Admittedly it is difficult for any Chancellor or ruler to go contrary to the advice of the General Staff when it claims that only by following its advice can security be assured. But be that as it may, in the First World War Gen. Ludendorff was able to dominate German foreign policy, and to lead Germany on to ruinous defeat and revolution which, historians point out, could have been avoided had less militaristic counsels prevailed.

It is clear then, that these two dangers: the arrogant character of the officers, and the decisive influence of the General Staff on foreign policy, are the ones feared by critics of the German General Staff. Both are real dangers, and it is not surprising that we see them frequently pointed out to American law makers. Note the testimony on the National Security Act of 1947 given before the House of Representatives Committee on Expenditures by Adm. Zacharias: "The Joint Staff should be a secretariat, stated in the law, if we are to avoid a very dangerous situation. Unless so specified, the Joint Staff becomes in fact a national General Staff capable of incorporating all the evils of the German system." Fletcher Pratt: "The German General Staff, instead of remaining an organ of the Government, became the government itself for all effective purposes, dragging Germany into war after war. There is a good chance it would set us on the first step towards military dictatorship and becoming an aggressor nation. Maybe it would be different in our case; but that is what all the others have said." Adm. Radford "finds no virtue in a military organization such as the German." He would "limit the Joint Chiefs of Staff to a 40 man secretariat without executive power, without authority to function as a military staff, and prohibited from functioning as a National General Staff or engaging in work of

an administrative nature that pertains to the armed services."

So much for the German General Staff of the Army. It should not be confused with Hitler's Armed Forces General Staff (OKW) which was the top staff in Germany during World War II, and a joint staff. The General Staff of the Army regarded the OKW as "amateurs serving an amateur." It is interesting to note that Hitler detested the General Staff of the Army and its General Staff Corps. He abused them with such phrases as "a club of intellectuals representing defeatism wrapped up in intellectualism," "professional obstructionists," "burdened by the weight of the military knowledge."

At this point, having briefly set forth the arguments for and against a United States General Staff, and having endeavored to make clear the character of the German General Staff, we are almost in position to evaluate and decide.

However, we should first glance objectively at the present National Security Organization. No one denies it has faults. Committee action in that critical focal point of the security structure, the Joint Chiefs of Staff, is deplored and belittled daily. Many of the operations of the military establishment flow from the Chiefs' decisions, and the work of the civilian agencies of the National Security Organization is closely affected by them. For instance, the National Security Resources Board, the Munitions Board, and the Research and Development Board can not lay out their plans effectively without guidance from the Joint Chiefs of Staff. Even the President, the Congress and the National Security Council need the Chiefs' strategic advice. The plans they make affect all the functions of Government, yet it has been pointed out that in the Joint Chiefs of Staff there is unacceptable delay, weak compromise, strong service bias and remoteness from other vital agencies.

The Joint Chiefs, however, stand not alone before the critical onslaught; they are merely the most publicized. As Mr. Eberstadt has made clear, "the Munitions Board has not succeeded in establishing a pattern for achieving prompt decision"; "the National Security Council has failed to produce firm

top-level national policy"; "the Secretary of Defense, lacking clearly defined authority and adequate staff assistance has been unable to keep the whole involved process in order." These, then, are some of the over-all faults of the present organization for national security.

All these faults, it is alleged, would be corrected by the United States General Staff. There would be little delay, no indecision. Strategy would be closely meshed with the national economy since the Munitions Board's functions would be assumed by the General Staff. There would be no lack of intimate association between the Research and Development Board and those responsible for strategy, because its functions too would be shouldered by the General Staff. With clear authority in the military realm, the Chief of the General Staff would soon have things running in tip-top shape.

Before rendering decision as to the advisability of such a General Staff there remains only to set forth the virtues of the present system.

First, the system provides a theoretically sound framework within which political, economic and military planning can be effectively interwoven. Second, it keeps too great power out of the hands of any one man short of the President. Third, it provides for unified, one-man command in the field. Fourth, it is working fairly well. When one considers that the Army and Navy have been operating unilaterally for a century and a half, one scarcely expects a great deal in a year and a half. Fifth, praise and extenuation for it as well as criticism of it have been offered. With respect to the Joint Chiefs of Staff it has been said that: "They are a splendid engine of military skill and thinking." "Under the guidance of the Joint Chiefs of Staff, substantial strides have been taken." "Individually, the Joint Chiefs of Staff have been too heavily burdened with departmental obligations to give to their important duties as members of the Joint Chiefs of Staff the time and thought that those duties demand." "During the war the Joint Chiefs of Staff justified itself as an excellent mechanism for strategic planning and for carrying strategic plans into effect." "The responsibilities assigned to the Joint



Official U. S. Navy Photograph

ONE RESULT OF HITLER'S GENERAL STAFF

The U. S. Navy takes over control of Bremen. Both Germany and Japan used the General Staff system in World War II, despite the fatal defects shown by this Prussian system in World War I.

of Staff are extraordinarily difficult complex, even more so in peace than in war. The criteria upon which to form their judgments have been vague and conflicting, and the conflicting pressures upon them are heavy." "The Joint Chiefs of Staff have proved its worth and should be continued."

reference to the other vital organizations of the National Security Establishment. The heartening statements could be made, but, for brevity's sake, will be omitted.

are arrived at the points of evaluation. We are turning now to consideration of the points advanced for the United States General Staff—objectivity, quick decision, efficiency, distinction—it must be proved that all are sound. One may be asked, however, for wondering whether not a slow, but at all is not better than a hasty one. At the highest level, is not the essential judgment a thorough consideration from every view, a patient, thorough appraisal of every facet and possibility, rather than a quick answer? The need for speed in basic decisions at the Joint Chiefs of Staff level is apparent, although the need for rapid action in the field is admitted by all and has been provided for by the Unified Commands. We are to fly in the face of experience, to say that "many heads are better than one" and to prove once again that "all that is learned from history is that nobody learns from history," then let us continue to favor quick decision in the Joint Chiefs of Staff.

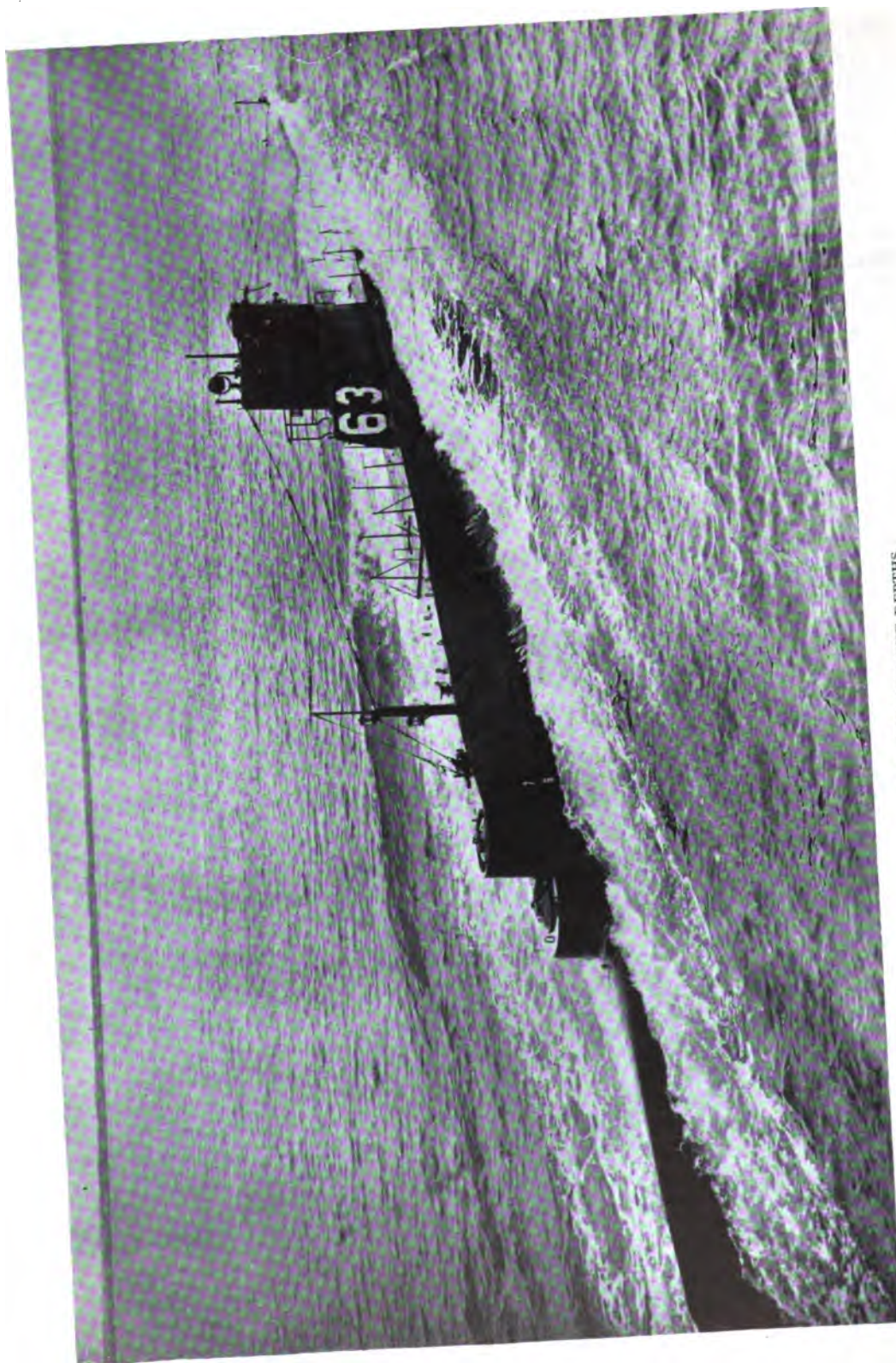
The possibility of ill-considered decision in the General Staff pales into insignificance, how-
ever, alongside the danger of abuse of power. Here is the tremendous, overwhelming argument against the General Staff. It is the President, the Secretary, and the public, its potential for evil in the hands of

the wrong man would be unlimited. With the entire armed might of the nation at his disposal, he might easily effect a *coup d'etat*, and there would be no substantial counterforce to oppose him. Now, at least, we have no one military man with all the military forces at his command. Any Service commander with foul designs would have two other Services to reckon with. A Secretary of Defense bent on dictatorship would have to suborn all three Services. As long as man's nature lends itself to the lust for and abuse of power, we would be wise to keep the greatest military force in the world out of the hands of those who might—it is remote but it is possible—abuse it to our own undoing.

If we could be sure that the Chief of Staff and the General Staff would always be high-minded, public spirited men of infinite wisdom, resource and tolerance, with no other concern than the good of the nation *and an unerring ability to determine exactly of what that good consisted*, then the United States General Staff would be the answer to our problem. Since we are assured by the research and development people that such men are not to be expected in the foreseeable future, it would be well to oppose formation of a General Staff.

Is there hope without a United States General Staff? Mr. Eberstadt, who appears to be as qualified as anyone and better qualified than most, thinks the existing machinery, with a few minor adjustments, will soon shake down to a smooth-running engine of national security. Yet even if there were little hope of improvement, it appears far wiser that the National Military Establishment proceed in its so-called "inefficient and blundering way of hammering things out by a long process of argument, compromise and inter-service struggle" than to ever commit itself to a United States General Staff of the type outlined herein.





Official U. S. Navy Photograph

DUCKING FOR THE DEPTHS

A U. S. submarine takes a sharp incline as she makes a quick war-time dive.



Changes in the Board of Control

Naval Academy.

At its June monthly meeting the Board of Control accepted with regret the resignation of Captain Frank T. Ward, Jr., U. S. Navy, as a member of the Board, and elected in his place Captain Robert B. Pirie, U. S. Navy, who is succeeding Captain Ward as Commandant of Midshipmen at the

Coming Naval Institute Books

In addition to its usual schedule of new and revised professional books and text books, the Naval Institute now has underway the publication of a book that should be of nationwide interest. This is the "History of U. S. Submarine Operations in World War II," already in the hands of the printer and scheduled for publication in the late summer or early fall. The first complete and fully authentic history of these operations, it will contain details and stories never before released. In size, number of pages, and amount of photographs and color-plates, it will be an outstanding example of the finest in bookmaking. Since it is the Navy Department's express wish that this book be offered to all present or former members of the Armed Forces at the lowest possible price, the Naval Institute will make a special reduced pre-publication price to all such personnel, as well as to Institute members. Please watch the pages of the Naval Institute PROCEEDINGS for further information on the book and the way in which it may be ordered at the special pre-publication price.

Also in preparation is "The United States Coast Guard, 1790-1915: a Definitive History." Covering the whole origins and histories of the Revenue-Marine, the Revenue Service, the Life-Saving Service, and other services that finally evolved into the Coast Guard, this history will be the complete, authentic account of that famous service from its inception down to the First World War. It is proposed to publish later a companion volume covering the subsequent history of the Coast Guard, including both World Wars.

Another book, "Naval Leadership," concerning which we have had many inquiries, is also in the hands of the printer. Prepared because of the need for such a book by the midshipmen at the Naval Academy, this work will include not only the principles of naval leadership, but also actual lessons and examples sent in from the various ships, fleets, and shore stations, with an analysis of the specific problems involved.

In the autumn we plan to send to the printer the copy for the Pictorial and Textual History of the U.S.S. *Enterprise*. In covering completely the history of that famous carrier, the typical story of sea-air power in World War II will be revealed to the reader.

Finally, the Naval Institute will publish a special "History of the U. S. Naval Gun Factory at Washington" to coincide with the 150th anniversary of the Washington Navy Yard. This book will contain unique pictures and stories of the Navy's famous gun factory from its earliest days to its stupendous feats during World War II, and will be a book of special interest to a great many people besides historians, both inside and outside the Service.

Future issues of the PROCEEDINGS will give more complete details as to publication dates and prices of the above-mentioned books.

Special Notice

U. S. Naval Institute General Prize Essay Contest, 1950

A PRIZE OF NOT LESS THAN \$500 and of not more than \$1,500, a gold medal, and a life membership in the Institute will be awarded for the best essay submitted on any subject pertaining to the naval profession, should the Board of Control consider the essay to be of sufficient merit. Should the prize be awarded to a previous winner, a gold clasp suitably engraved will be given in lieu of the medal and the commuted value of the life membership in lieu of the life membership.

Irrespective of the award of the "Prize," one or more essays may receive "Honorable Mention," if of sufficient merit to justify the award. Essays awarded "Honorable Mention" shall receive such compensation as may be adjudged by the Board of Control, but not including a life membership.

In the event that no essay is adjudged of sufficient merit to receive the "Prize" or an "Honorable Mention," the best essay submitted may receive a special award in lieu thereof.

The following rules will govern this competition:

- (1) Essays should not exceed 8,000 words.
- (2) Essays must be received by the Secretary-Treasurer on or before January 1, 1950.
- (3) The name of the competitor shall not appear on the essay, and each essay must have a motto in addition to the title. This motto shall appear (a) on the title page of the essay, (b) on the outside of a sealed envelope containing identification of the competitor, (c) above the name and address of the competitor inside the envelope containing this identification. This envelope will not be opened until the Board has made the awards. Essays and identifying envelope must be mailed in a large sealed envelope marked "General Prize Essay Contest."
- (4) The awards will be made by the Board of Control, voting by ballot and without knowledge of the names of the competitors.
- (5) The awards will be made known and presented to the successful competitors as soon as practicable after the February meeting of the Board.
- (6) All essays must be typewritten, double spaced, on paper 8½" x 11", and must be submitted in triplicate, each copy complete in itself.
- (7) Essays awarded the "Prize," "Honorable Mention," or "Special Award" are for publication in the Naval Institute PROCEEDINGS. Essays not awarded a prize may be published at the discretion of the Board of Control, and the writers of such essays shall be compensated at the rate established for articles not submitted in competition.
- (8) Attention of contestants is called to the fact that an essay should be analytical or interpretive and not merely an exposition or personal narrative.

William G. Cooper,
Captain, U. S. Navy, Secretary-Treasurer

UNITED STATES NAVAL INSTITUTE PROCEEDINGS

*For the advancement of professional, literary and
scientific knowledge in the Navy*

August, 1949

Edited by CAPTAIN W. G. COOPER, U. S. NAVY

Managing Editor—COMMANDER ROY DE S. HORN, U. S. NAVY (RET.)

Associate Editors

CAPTAIN JOSEPH M. P. WRIGHT, U. S. NAVY

COMMANDER C. P. LEMIEUX, U. S. NAVAL RESERVE (INACTIVE)

LIEUTENANT COMMANDER H. O. WERNER,
U. S. NAVAL RESERVE (INACTIVE)



United States Naval Institute

Publication Office: Menasha, Wisconsin

Editorial and Business Office: Annapolis, Maryland

Advertising Department: 2000 Connecticut Ave. N.W., Washington, D.C.

Copyright, 1949, by U. S. Naval Institute

Officers of the Institute

PresidentADMIRAL LOUIS E. DENFELD, U. S. NAVY
Vice-PresidentREAR ADMIRAL JAMES L. HOLLOWAY, JR., U. S. NAVY
Secretary-TreasurerCAPTAIN W. G. COOPER, U. S. NAVY

Board of Control

ADMIRAL LOUIS E. DENFELD, U. S. NAVY (ex officio)
REAR ADMIRAL JAMES L. HOLLOWAY, JR., U. S. NAVY (ex officio)
REAR ADMIRAL W. N. THOMAS (Ch.C.), U. S. NAVY
REAR ADMIRAL ELLIS REED-HILL, U. S. COAST GUARD
REAR ADMIRAL JOHN W. ROPER, U. S. NAVY
CAPTAIN M. A. SAWYER, U. S. NAVY
CAPTAIN ROBERT B. PIRIE, U. S. NAVY
MAJOR JOHN E. WILLIAMS, U. S. MARINE CORPS
CAPTAIN W. G. COOPER, U. S. NAVY (ex officio)

Past Presidents

ADMIRAL DAVID D. PORTER, U. S. NAVY, 1873
REAR ADMIRAL JOHN L. WORDEN, U. S. NAVY, 1874
REAR ADMIRAL C. R. P. RODGERS, U. S. NAVY, 1875-78
COMMODORE FOXHALL A. PARKER, U. S. NAVY, 1878-79
REAR ADMIRAL JOHN RODGERS, U. S. NAVY, 1879-82
REAR ADMIRAL C. R. P. RODGERS, U. S. NAVY, 1882-83
REAR ADMIRAL THORNTON A. JENKINS, U. S. NAVY, 1883-85
REAR ADMIRAL EDWARD SIMPSON, U. S. NAVY, 1885-87
REAR ADMIRAL STEPHEN B. LUCE, U. S. NAVY, 1887-98
REAR ADMIRAL WM. T. SAMPSON, U. S. NAVY, 1898-1902
REAR ADMIRAL H. C. TAYLOR, U. S. NAVY, 1902-1904
REAR ADMIRAL C. F. GOODRICH, U. S. NAVY, 1904-1909
REAR ADMIRAL RICHARD WAINWRIGHT, U. S. NAVY, 1909-11
REAR ADMIRAL BRADLEY A. FISKE, U. S. NAVY, 1911-23
VICE ADMIRAL WILLIAM L. RODGERS, U. S. NAVY, 1923-24
ADMIRAL HENRY B. WILSON, U. S. NAVY, 1924-26
ADMIRAL HILARY P. JONES, U. S. NAVY, 1926-28
REAR ADMIRAL EDWARD W. EBERLE, U. S. NAVY, 1928-29
ADMIRAL S. S. ROBISON, U. S. NAVY, 1929-31
REAR ADMIRAL M. L. BRISTOL, U. S. NAVY, 1931-33
ADMIRAL WILLIAM H. STANDLEY, U. S. NAVY, 1933-35
ADMIRAL DAVID FOOTE SELLERS, U. S. NAVY, 1935-37
FLEET ADMIRAL WILLIAM D. LEAHY, U. S. NAVY, 1937-40
ADMIRAL H. R. STARK, U. S. NAVY, 1940-42
FLEET ADMIRAL CHESTER W. NIMITZ, U. S. NAVY, 1942-43
FLEET ADMIRAL E. J. KING, U. S. NAVY, 1943-46
FLEET ADMIRAL CHESTER W. NIMITZ, U. S. NAVY, 1946-48

For the Advancement of Professional, Literary, and Scientific Knowledge in the Navy

DESTROYERS TO THE RESCUE. With the U. S. carrier *Bunker Hill* aflame from two crash dives by Japanese *Kamikazes* during the battle off Okinawa, a destroyer races to intervene against further *Kamikaze* attack... *Front Cover Official U. S. Navy Photograph*

THE ATLANTIC ALLIANCE.....	857
<i>By Robert McClintock</i>	
MAN AND MATERIALS IN THE POLAR REGIONS.....	865
<i>By George W. Grupp</i>	
JUNGLE ALLIES.....	873
<i>By Major John L. Zimmerman, U. S. Marine Corps Reserve (Inactive)</i>	
THE RIDDLE OF COMBINED ARMS: 1949.....	881
<i>By Major Guy Richards, U. S. Marine Corps Reserve</i>	
THE NAVY'S COLOSSAL CRANE.....	891
<i>By Warren Hughes</i>	
THE UNIFORM PROBLEM.....	895
<i>By Lieutenant J. C. Busby, S.C., U. S. Navy</i>	
JAPANESE IMPERIALISM AND THE AGUINALDO INSURRECTION.....	901
<i>By James K. Eyre, Jr.</i>	
THE NAVAL OFFICER AS A SPEAKER AND INSTRUCTOR.....	909
<i>By Captain I. E. McMillian, U. S. Navy</i>	
THE U. S. NAVY'S FIRST SEAGOING MARINE OFFICER.....	919
<i>By Captain Lucius C. Dunn, U. S. Navy (Retired)</i>	
INSHORE NAVIGATION WITH RADAR AND VPR.....	925
<i>By Captain William Hugh Organ, U. S. Navy</i>	
NAVY SQUADRONS IN THE BERLIN AIRLIFT (<i>Pictorial Section</i>).....	931
DISCUSSION, COMMENTS, NOTES.....	941
BOOK REVIEWS.....	945
PROFESSIONAL NOTES.....	951
SECRETARY'S NOTES.....	971

The opinions or assertions in the articles are the private ones of the writers, and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

Published monthly at 450 Ahnaip St., Menasha, Wis.
 Executive, Editorial and Business Offices, U. S. Naval Institute, Annapolis, Md.
 Advertising Department, Suite 710, 2000 Connecticut Ave., N.W., Washington, D.C.
 Entered as second-class matter at the post-office at Menasha, Wis., April 4, 1922, and at the post-office at Annapolis, Md., under Act of August 4, 1912. Acceptance for mailing at the special rate of postage provided for in section 1103, Act of October 3, 1917, authorized March 13, 1922.
 Membership dues (including PROCEEDINGS), \$2.00 a year.
 Subscription rate, \$4.00 a year. (Foreign postage, \$1.00 extra.) Single copies 50 cents.

NATIONWIDE RECOMMENDATION OF
The United States Naval Institute's Outstanding and Timely Book

JOHN PAUL JONES

Fighter for Freedom and Glory

By LINCOLN LORENZ

THE VIVID STORY AND PORTRAIT

The book tells a fascinating story with verve and color. . . . The story is one of the most interesting in our martial annals. . . .

—Allan Nevins in THE BOOK-OF-THE-MONTH CLUB NEWS; August, 1943

This new biography of John Paul Jones . . . makes stirring reading not only for the naval-minded but for anyone who loves a story of true adventure and struggle. . . . The great Commodore's character is ably portrayed as well as his 45-year life of adventure.

—Rear Admiral John Downes in THE CHICAGO DAILY NEWS; July 21, 1943

. . . a dynamic story with a many-sided appeal. It contains all the elements of fiction with the added charm of reality, accurately presented in the book with great literary skill.

—Captain Dudley W. Knox in U. S. NAVAL INSTITUTE PROCEEDINGS; January, 1943

As an interpreter of Jones the man—lion-hearted in battle, astute in naval planning, sincere to the point of idealism in his attachment to the American cause, and over-susceptible to feminine charms—Dr. Lorenz is excellent.

—THE AMERICAN NEPTUNE, A Quarterly Journal of Maritime History; July, 1943

The author has given us a credible, honest, fiery, and quixotic John Paul Jones, if not a superman . . . the book abounds in splendid authenticated anecdotes of Jones' youth and later feats of derring-do.

—THE HARTFORD COURANT MAGAZINE; August 1, 1943

. . . this biography of John Paul Jones will prove absorbing.

—THE CHRISTIAN SCIENCE MONITOR; September 18, 1943

THE TRUTHFUL INTERPRETATION

. . . it is objective and thorough in its evaluation of historical evidence . . . it is a truth-seeking book.

—THE NEW YORK HERALD TRIBUNE WEEKLY BOOK REVIEW; July 18, 1943

So completely and painstakingly objective a story could be only a labor of love.

—THE WASHINGTON DAILY NEWS; August 17, 1943

. . . the romantic tosh has been tossed overboard.

—THE SAN FRANCISCO NEWS

Dr. Lorenz clear away a mass of fiction . . . slashing through legend and lies.

—THE BOOK-OF-THE-MONTH CLUB NEWS; August, 1943

The work is one of historic breadth, the author being obviously intent on close reasoning and astute character study.

—THE PROVIDENCE SUNDAY JOURNAL; July 18, 1943

The author's judgments are wise and farseeing.

—THE HARTFORD COURANT MAGAZINE; August 1, 1943

THE DEFINITIVE SCOPE

. . . it has remained for Lincoln Lorenz to produce a John Paul Jones *life* that might be considered definitive . . . a masterpiece of biographical writing which stands head and shoulders over all previous Jones efforts.

—THE AMERICAN NEPTUNE; July, 1943

Jones' tangled, half obscure, romantic career for the first time finds something approaching a definitive treatment. . . . The story . . . is at last told with accuracy and completeness.

—THE BOOK-OF-THE-MONTH CLUB NEWS; August, 1943

John Paul Jones . . . is very likely the definitive life of the man who raided Whitehaven.

—THE NEW YORKER; July 17, 1943

. . . invaluable to the historical student of the U. S. Navy.

—SEA POWER; September, 1943

Here in detail Lorenz tells the fullest story to date of that fantastic Russian adventure. Almost no phase of Jones' life escapes this new biographer who expended five years in research, preparation, and the writing of this volume. Much of the detail he recounts appears for the first time.

—THE WASHINGTON DAILY NEWS; August 17, 1943

Illustrated Regular Edition, \$5.00

Limited Edition of 500 copies numbered and registered, manufactured from paper of 50% rag content and with wide margins, and inscribed by the author, \$7.00.

U. S. NAVAL INSTITUTE
ANNAPOLIS, MARYLAND

Date

For the enclosure of \$....., send cop..... of the limited edition and cop..... of the regular edition of *John Paul Jones*.

Name

Address



"At Home"... At Sea

Fairbanks-Morse Marine Diesels

There's nothing like Fairbanks-Morse Marine Diesels for seagoing service. They offer the simplicity, fuel economy, swift response and maneuverability that are demanded of marine engines. They're truly seagoing power plants, designed and built exclusively for marine service... by marine engineers. For instance, there's the new Model 31 which features heavy-duty 2-to-1 reduction gears that allow the use of more efficient slow speed propellers, with fewer moving parts, full pressure lubrication, and interchangeable, precision-type bearings that are practically indestructible. This new Model 31 is just one of the complete line of Fairbanks-Morse Marine Diesels that are "at home"... at sea. Fairbanks, Morse & Co., Chicago 5, Ill.



FAIRBANKS-MORSE,

a name worth remembering

DIESEL LOCOMOTIVES • DIESEL ENGINES • PUMPS • SCALES • MOTORS • GENERATORS
STOKERS • RAILROAD MOTOR CARS and STANDPIPES • FARM EQUIPMENT • MAGNETOS



Official U. S. Navy Photograph

SEA POWER WILL BE VITAL TO THE ATLANTIC ALLIANCE

With great stretches of ocean between the participating members of the Atlantic Alliance, the sea lanes must be avenues of both military aid and economic supplies. Only sea-air power can keep them open.

UNITED STATES NAVAL INSTITUTE PROCEEDINGS

Vol. No. 75, No. 8

AUGUST, 1949

Whole No. 558

THE ATLANTIC ALLIANCE

By ROBERT McCLINTOCK

ENDURING alliances are born, not made. The seed of national interest is planted in the soil of mutual advantage, and growth is almost always forced in the hothouse of external pressure. As long as the soil and seed remain fertile the plant prospers and puts out new roots and branches to hold fast against danger and to fend off peril. An alliance must be clearly defined as to its objectives and, as Bismarck said, "be reinforced by the interests" of the states concerned. Thus there are the lasting alliances, those born of necessity and enduring through adversity, such as the valiant league of the Grecian city-states against the sea power of Persia; the most ancient existing alliance, that between Britain and Portugal; and that most recent of the "natural alliances," the Organization of the American States.

Other temporary arrangements of suspicious self-interests have taken the name of "alliance." There were three Triple Alliances, to say nothing of the one Quadruple Alliance born of the mysticism of the Tsar and the craft of Metternich. Even so, the Holy Alliance was a greater factor for peace than the triple Triple Alliances—two, formed in 1688 and again in 1795, against the power of France, and the third, between Germany, Austria and Italy in 1882, against France and Russia. This latter treaty did not have sufficient pull of mutual interest to keep the Italian satellite within its gravitational field. And the pacts between Ribbentrop and

Molotov, between Molotov and Matsuoka, in 1939 and 1941, were less than alliances; they were contracts in duplicity, purchasing time at the price of honor.

Other common arrangements for joint action by groups of states have been called alliances and indeed were, so long as the military emergency lasted. Such was the grouping of disparate powers in the coalition which finally wore out France and beat Napoleon. Such was the even more disparate group of powers which formed the coalition which wore out Germany and beat Hitler. But for all the ringing periods in the Declaration of the United Nations, signed on January 1, 1942 at the White House, and for all the idealism enphrased in cadenced sentences in the Atlantic Charter, these instruments did not have within them the seed of self-interest planted in the soil of mutual advantage which could last beyond the immediate interest and the instant advantage.

Nevertheless the Atlantic Charter and the Declaration of the United Nations set forth principles which, if lived up to, would have made the Millennium follow upon the Armageddon in which the world then bloodily struggled. It was felt in many lands, though not in all, that the conflict could have no meaning unless it give rise to a more rational order of international conduct. President Roosevelt, with deeper insight, called it a war for survival. Even so, men with good hearts and brains in all the lands hoped, in various ways, that this was the last great

FOR OVER seventeen years an officer of the American Foreign Service, Mr. McClintock was U. S. *Chargé d'Affairs* at Helsinki during World War II. An official at the San Francisco conference, and stationed for the past four years in the Department of State as Special Assistant to the Director of the Office of United Nations Affairs, he is at present serving as First Secretary of the American Embassy at Brussels.

outpouring of blood and iron, and that man would now so arrange his affairs that the intercourse of national states would be as peaceful and well ordered as the life within the metropolitan domain. So it was that, following the identical pattern set by the first World War, and avoiding (it was thought) the mistakes of Versailles, the victorious United Nations met at San Francisco four years ago and established a world organization to keep the peace they had so recently won.

A reading of merely the Preamble, to say nothing of the entire United Nations Charter, suffices to show how the high hopes of San Francisco have thus far been frustrated. "We the peoples of the United Nations, determined to save succeeding generations from the scourge of war, which twice in our lifetime has brought untold sorrow to mankind" [and who in three years have witnessed armed conflict in Indonesia, Greece, Palestine and China], "and to reaffirm faith in fundamental human rights, in the dignity and worth of the human person, in the equal rights of men and women and of nations large and small" [as "reaffirmed" by the secret police of Russia, Bulgaria, Rumania, Hungary, Albania and Yugoslavia, to say nothing of Poland and Czechoslovakia, and by the "respect" for small nations shown by the U.S.S.R.] "... to practice tolerance and live together in peace with one another as good neighbors" [as for example, the neighborly conduct toward Greece of the three states on its northern frontier], "and to unite our strength to maintain international peace and security" [by not agreeing to provide the Security Council with its intended striking force]—a reading of this Preamble, phrased in the superb language of Marshal Smuts, is a saddening experience for the man of goodwill today.

This is not an indictment of the United Nations. The Charter is as good a constitution for a world peace-preserving organization as is possible today. So was the Covenant of the League of Nations. What is required is not a better constitution, but better performance in living up to the Charter we have. This leads us to the fundamental fact that the United Nations Charter was adopted on the assumption that the signatures on the parchment were binding, that it was a treaty which meant what it said, that the principles and purposes it so nobly phrased would be put into practice. This largely boils down to saying that the Charter was adopted on the assumption that the U.S.S.R. would develop a new dialectic which would modify the Marxian one, and that it would treat with its allies in peace at least as equitably as with its allies in war.

One cannot know with what measure of hope or cynicism the masters of Soviet power signed the Declaration of Yalta and its sequence, the Charter of the United Nations. All one can do is to judge the word by the deed. Molotov, who has signed so many "binding" promises with so many people, from Ribbentrop and Matsuoka to Roosevelt and Churchill, signed the Five Power Statement in San Francisco by which the five Permanent Members of the Security Council promised to use their veto power only in the most exceptional and solemn circumstances. Yet by the end of 1948 the Soviet representative on the Security Council had exercised the veto power 27 times, as compared with a total of only two vetoes cast in the same time by all the other Permanent Members together.

In the Security Council, which was charged under Article 43 of the Charter with negotiating agreements with Members to make available to the Council armed forces, assistance, and facilities necessary for the purpose of maintaining international peace and security, no progress whatever was made toward assembling a force with which to keep the peace. The Council's Military Staff Committee, made up of the representatives of the Chiefs of Staff of the five Permanent Members, met in a series of increasingly sterile discussions, mulling over the first principles which should govern the UN striking force, but without agreement on

those principles. For almost two years the Soviet representative did not even produce a plan, and thereafter spent hours of argument in insisting that the other four powers adopt the Soviet suggestion for absolute equality of force—plane for plane, ship for ship, and trooper for trooper—as the condition precedent to any further advance toward a security force in being and not in blueprint.

Meanwhile, although there was no increase in collective security while the Security Council lay stalemated on the question of its armed forces, the Soviet Union beat the drum for disarmament. The primary objective was to divest the idealistic Americans of their atomic bomb. The secondary objective was to pick up any windfalls in the way of increased relative military strength which might come from, say, a one-third reduction in the armed forces of Great Britain, China, France, the United States, and the manpower-rich U.S.S.R. A third by-product of the Soviet disarmament drive was its propaganda effect; and both the Soviet Union and the United States in the debates before the third regular session of the UN General Assembly in Paris seemed more attentive as to how their disarmament speeches sounded on a loud (very loud) speaker than to the grave substance of that grave problem.

Basically, however, it was becoming clear even through the distortion made by the heat waves of propaganda that, largely because of the attitude of Russia and its Communist satellites, the United Nations had thus far been stultified in much of its primary endeavor, and that collective security had not yet been achieved according to the great diagram of the Charter. In fact it seemed, three years after the birth of UN, that the old and terrible cycle was again beginning: the lack of collective security which leads to rearmament, which further lessens the prospect of collective security, which leads to more armament and eventually war.

Although these facts were emerging from the steam of disputation, at least in the American people there was a very deep-seated conviction that the United Nations was a good thing and that it ought to function as intended. There was also a firmly rooted illusion that the United Nations

could "do" something about every problem that came up, even though the record made clear that in important aspects it lacked the tools with which to work. Psychologically it seems very probable that the choice of names for the new world organization was unwise, at least from the effect it had on the American mind. Most Americans thought of "United Nations" in terms of a type of "United States," soundly organized, with due process of law, a police force (on paper), and a set of principles which were right as rain. The United States with its Constitution could "do something" when it had to, and the United Nations, with its fine new Charter, could "do something," too.

The writer can testify to this attitude in the public mind from a score of instances in speaking tours about the country. The logic was: "We have the United Nations now, it was created for just the type of problem you are talking about, so let the United Nations do it." There was little concept that the United Nations is a loosely banded organization of very self-consciously sovereign states, (except the Soviet satellites, which are self-consciously un-sovereign), grouped under the meaningless and self-contradictory Charter rubric of "sovereign equality"; and that the seed of self-interest was implanted in what was yet the very loose soil of mutual advantage.

To make matters more confusing, more impetuous Americans, including a very sincere core of young veterans who were impatient to see their sacrifice repaid in the form of a better world, came out in full cry against the United Nations, damning its weakness and insisting on World Government. How they expected States which were not even then conforming in their international conduct to the simple rules of decency laid down in the Charter, to submit to the greater discipline of world government was never explained.

What was needed was either a prompt improvement in international morality, a willingness to play the game according to the rules established by the UN Charter, or else a more practical method, within the framework of the Charter, to ensure that its rules were respected.

As on so many other occasions, it was Arthur Vandenberg and the United States

Senate which intervened at the optimum moment to show the way. It is also an impressive fact that the way they showed was one which had been worked out by the hard hewing of history; by the gradual evolution within the Western Hemisphere toward a regional organization which lived by the code d'Artagnan—"one for all and all for one."

The origin of this development goes a long way back in American history. It goes back to the days of Canning and Richard Rush, of John Quincy Adams and James Monroe; to the Monroe Doctrine, in fact, which was, by odd historical coincidence, floated on the stream of popular consciousness in the United States by fear of Russian encroachment—this time like a glacier grinding from Alaska to the California coast. At all events the old, unilateral Monroe Doctrine, which had termed the Western Hemisphere "out of bounds" to further encroachment from the Old World, had metamorphosed during a century to the point where it became, under pressure of the last war, a multilateral doctrine. At Habana, first, in 1941, and more formally in 1945 at Chapultepec, the American Republics declared that a threat of aggression from outside the hemisphere against one American State was a threat against all, and vice versa. This principle was elaborated and made a legal, contractual obligation at Petropolis in 1947, when the Treaty of Rio was signed which came into effect on December 3, 1948. It embodied the basic principle described at the outset of this essay—the seed of self-interest implanted firmly in the soil of mutual advantage.

The Treaty of Rio was a "regional arrangement" within the scope of Chapter VIII of the United Nations Charter. The basic concept is set forth in Article 52:

(1) Nothing in the present Charter precludes the existence of regional arrangements or agencies for dealing with such matters relating to the maintenance of international peace and security as are appropriate for regional action, provided that such arrangements or agencies and their activities are consistent with the Purposes and Principles of the United Nations.

(2) The Members of the United Nations entering into such arrangements or constituting such agencies shall make every effort to achieve pacific

settlement of local disputes through such regional arrangements or by such regional agencies before referring them to the Security Council.

(3) The Security Council shall encourage the development of pacific settlement of local disputes through such regional arrangements or by such regional agencies either on the initiative of the states concerned or by reference from the Security Council.

(4) This Article in no way impairs the application of Articles 34 and 35.

The foregoing should be read in conjunction with Article 51 of the Charter, which reads as follows:

"Nothing in the present Charter shall impair the inherent right of individual *or collective* [italics added] self-defense if an armed attack occurs against a Member of the United Nations, until the Security Council has taken the measures necessary to maintain international peace and security. . . ."

From the Treaty of Rio it was but a logical progression in point of time, and in consideration of the political algebra that U.S.S.R. vs UN did not equal PAX, to the development and passage of the so-called "Vandenberg Resolution," on June 11, 1948. This basic policy statement of the Senate advised the President, among other things, to pursue the following objectives within the United Nations Charter:

(1) Progressive development of regional and other collective arrangements for individual and collective self-defense in accordance with the purposes, principles, and provisions of the Charter.

(2) Association of the United States, by constitutional process, with such regional and other collective arrangements as are based on continuous and effective self-help and mutual aid, and as affect its national security.

(3) Contributing to the maintenance of peace by making clear its determination to exercise the right of individual or collective self-defense under article 51 should any armed attack occur affecting its national security.

Meanwhile, stimulated by the example of the American States in Petropolis and by the Treaty which was the edifice of their architecture, an equally important development had taken place across the Atlantic. If a regional arrangement for self-defense within the Charter could work on one side of the Western Ocean, it might work on the other,

where the imperatives of time were more insistent and the imminence of danger more great. Since the Soviet Union chose not "to practice tolerance and live together in peace with one another as good neighbors" and was not "determined . . . to reaffirm faith in fundamental human rights . . . in the equal rights of men and women and of nations large and small," but on the contrary proclaimed the inevitability of conflict and girded its outer bastions with moats dug in the soil of Czechoslovakia and Poland, then it was time to follow the example of the Western World.

Thus it was that under the wise leadership of Paul Henri Spaak, and with the solid backing of Britain, the Western Union was formed. The treaty signed at Brussels on March 17, 1948 closely followed the Rio pattern and Articles 51 and 52 of the Charter. Although certain articles of the treaty provided for close cooperation to promote the economic recovery of Europe, for cultural collaboration and a strengthening of social bonds, the nuclear element of the pact was Article IV, which provided that:

If any of the High Contracting Parties should be the object of armed attack in Europe, the other High Contracting Parties will, in accordance with the provisions of Article 51 of the Charter of the United Nations, afford the party so attacked all the military and other aid and assistance in their power.

The treaty also provided in Article IX that:

The High Contracting Parties may, by agreement, invite any other State to accede to the present Treaty on conditions to be agreed between them and the State so invited.

At the same time, the United States with a prescience born of its new world responsibility was undertaking to restore that part of Europe which was willing to help itself, by the Marshall Plan, the European Recovery Program. Hungry men make Communists; fed men do not. A Europe integrated economically on lines of mutual advantage would be a peaceful Europe; if all the Continent could not be so organized, at least Western Europe could be helped to help itself; and with this infusion of economic aid the sick body would restore itself. Certainly

if the remorseless dialectic of the Kremlin had to be worked out, Western Europe must be made strong. The fate of the world, in a struggle between the super-Powers, lay not with the UN unaided, but with the United States and other nations which were resolved to live up to the principles of the Charter and to band together under the Charter to see that the rule of right conduct was preserved, if necessary, by force.

Thus it was that the idea of a North Atlantic Pact was developed. Analysis showed that the elements of an enduring alliance were present. The recent war had not only weakened Western Europe but had created a power vacuum in Germany, with the result that the military and political balance of power on the Continent was perilously one-sided. Furthermore the publicly proclaimed intentions of the U.S.S.R. were admittedly expansionist. And finally, the westward projection of Soviet power had made it strategically possible for the Soviet Union to dominate the rest of Europe by force. Given this situation, it was necessary for the West to combine in a collective defense arrangement, pledged to operate within the confines of the Charter, and thus by definition estopped from aggressive intent against the Soviet Union. A pact so conceived and so limited could not be regarded as inimical to a U.S.S.R. which really desired peace. It could only be regarded as an instrument for the restoration of confidence, which might become the base for a future pacific arrangement of interest between the great powers and their smaller coadjutors.

To specify more particularly the elements of such an enduring alliance: It should be within the framework of the United Nations Charter and operate "consistent with the Purposes and Principles of the United Nations." It should contribute to the maintenance of peace by providing greater national security to the members of the alliance through increasing their individual and collective capacities for self defense. It would make unmistakably clear the determination of the peoples concerned jointly to resist aggression from whatever quarter it might come. It should be operative within a carefully defined area and have adequate

machinery for immediate action. Finally, it should be based on the principle of continuous and effective self-help and mutual aid in all fields.

In formulating an enduring alliance such as the proposed North Atlantic Pact it is a first principle to define the area of its effect: to know exactly which states are to give immediate aid to which other states in the event of attack; the amount and nature of such aid; and the outer areas which might require consultation among the allies on given situations but which might not necessarily result in the automatic operation of the defensive system. The Rio Treaty, for example, specifically delineated the area in which its obligations became operative.¹ This Treaty also established two kinds of obligations: one providing that any attack within the delimited area should be regarded as an attack against all the parties, with each party in consequence obligated to assist in meeting the attack; and the other merely requiring consultation in event of armed attack outside the delimited area, or any other event indirectly threatening the parties.²

It is thus necessary to establish the "heart land" of the Atlantic Alliance. Which states are to be bound by the rule of d'Artagnan, of one for all and all for one? Which should send instant and continuous aid to what other partner under threat of attack; and what areas should be defined as limiting the geographical scope of the treaty?

The European core of such a heart land is already established in the Western Union: France, Belgium, Luxemburg, the Netherlands, and Great Britain. Great Britain includes Northern Ireland, while strategically all Ireland is one. Eire should, therefore, be included in the enduring alliance. On the North Atlantic lie, to the east, Norway and Denmark; to the West, Canada and the United States. In between are Greenland and Iceland, the former already within the enclave of the American defense system, as defined by the Treaty of Rio. All these islands, plus the Azores and Portugal, would enter the Atlantic defense zone, for the two systems, that of the Rio Treaty and the

other of the Atlantic Pact, will in a sense be concentric circles, overlapping in area as well as interest, mutually complementary to each other because the partners are in some cases the same, the threat of aggression identical, and the principle by which they operate established by Article 51 of the United Nations Charter, providing for collective defense.

Other states on the borders of the defense zone could be invited to adhere to the regional arrangement, either as full or limited members, if the maintenance of their integrity should be regarded as essential to the security of the group as a whole. Beyond this, the original members of the alliance should declare at the outset that any threat, whether direct or indirect, against the states of Western Europe as far east as the Stettin-Trieste line would call for immediate consultation by parties to the pact.

Pursuant to the Vandenberg Resolution, which expressed the almost unanimous opinion of the United States Senate, the American Government has undertaken conversations with the States members of the Brussels Pact, plus Canada, to work out a collective defense arrangement within the meaning of Articles 51 and 52 of the UN Charter, which will probably be inscribed in the pages of history as the North Atlantic Pact. It will not be called an alliance because the American public mind has for years been exorcised by the ancient shibboleth of "no entangling alliances," not recalling that even Washington, in his farewell address on September 17, 1796, although he warned against entangling "our peace and prosperity in the toils of European ambition, rivalry, interest, humor, or caprice," did say that "we may safely trust to temporary alliances for extraordinary emergencies." Nevertheless, the later phrase of Jefferson in his first Inaugural Address on March 4, 1801—"Entangling alliances with none"—has gone down the years as a warning tocsin to the American people. Because of this national aversion to the word "alliances" we must use the newspaper word "pact," or the even more generalized Charter word, "regional arrangement," to describe an otherwise precise and legally binding treaty contract. With such a mandate from the Senate and

¹ Rio Treaty, Articles 3 and 4.

² Rio Treaty, Article 6.

with the experience we have of the sound, evolutionary growth of such regional arrangements for collective self defense as the Inter-American Defense System established by the Treaty of Rio and the North European defense system set up by the Treaty of Brussels, the reaching of agreement for a North Atlantic Pact should not be far off. Perhaps by the time these pages are printed this newest instrument for keeping the peace will already have taken its place among the enduring alliances.

Sea power will be vital to the Atlantic Alliance. Not only are the islands of essence, but access to the coasts of Europe can only be had by retaining command of the sea. And access from the West to the coasts of Europe is essential to carry out the key principle of continuous and effective self-help and mutual aid. Furthermore, the naval implications of a North Atlantic Pact are by no means confined to the North Atlantic. Any conflict with an aggressor Power which fronts on other oceans would involve operations in those other oceans as well.

Without attempting to detail the naval requirements of the North Atlantic Pact, certain basic elements seem fairly apparent. First of all, of course, the merchant tonnage to carry essential supplies to and from European members of the partnership. Second, the fleet of escort craft to convoy the merchantmen. Third, naval vessels to ensure the security of the Atlantic islands which will continue as bases of allied air power. Fourth, carriers to operate offensively off the coasts of such of the Atlantic Partners as may require instant aid to beat off attack. Fifth, naval support and landing craft to establish beach heads on such coasts, if necessary. Sixth, large carriers for long range bombing attack. And finally, the anti-submarine arm of naval power acting with and supplemental to the convoy vessels, for such operations as mining narrow channels of egress or hunting down the new fast types of sub-sea vessel.

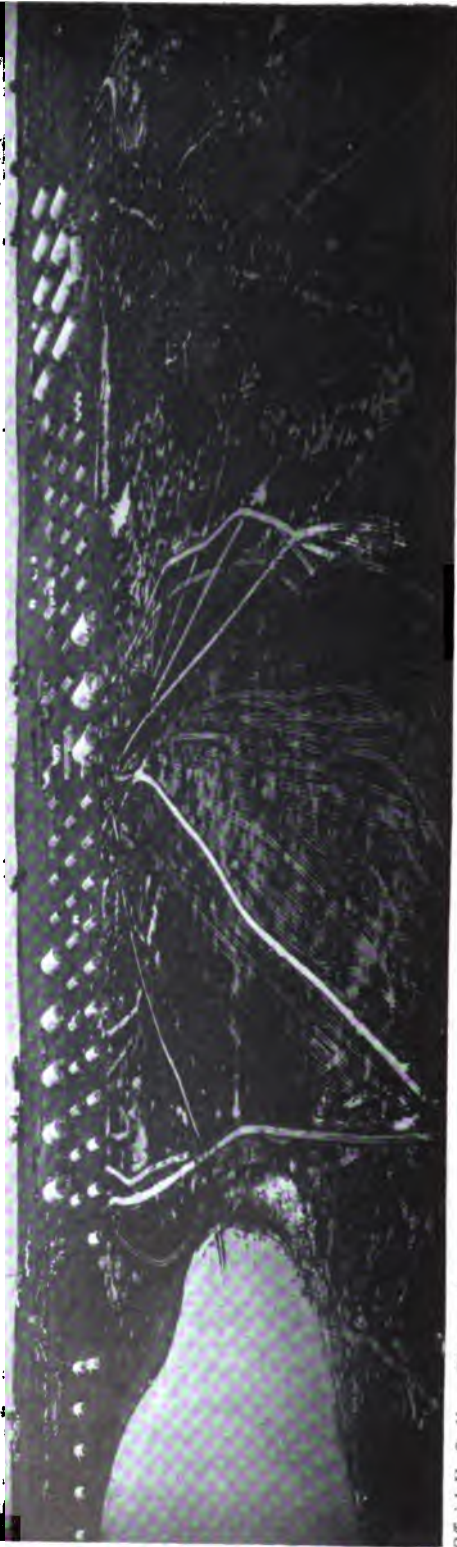
If the United States becomes a partner of the Atlantic Alliance, its strategic support should in the initial phase, at least, be limited to the three "A's"—Arsenal, Armada, and Air Power. There are valiant men on the western reaches of Europe still capable of

fighting for their homes and for the principles which have imbued European civilization with its deep meaning.

We have seen that the alliances which endure—irrespective of by what name they may go, whether pact, regional arrangement, or treaty—are those which are founded upon enlightened self-interest and mutual accommodation. We have seen also that at this stage in the development of the United Nations the intent of the Charter has not yet been entirely fulfilled. This is not to say that the UN has been tried and found wanting; rather, that governments have not sufficiently tried the UN and have been wanting in their willingness to give the Charter full effect. In consequence, in order to fulfill the promise of the Preamble and to live up to the purposes and principles established by the Charter, it has become necessary to resort to the regional arrangements provided for in Chapter VIII. Thus, the Inter-American Defense System and the Western Union of certain European Powers have come into being, and the even further ranging program for an Atlantic pact is now before governments who believe that peace must be maintained in accordance with principle.

Basically, it seems possible that if the North Atlantic Pact is accomplished there will be a real hope of lasting peace for years to come. Such an alliance, founded on principle and rooted in the soil of mutual interest, will redress the dangerous imbalance of power which now makes Europe ride like a ship in a high sea, listing toward the East. Once the balance is restored there will come a new confidence to peoples long out-worn with strife and fear. Confidence breeds courage and constructive strength. A Europe thus recovered might rise and look steadfastly to the light, nor fear the red glow on the eastern steppe. And once this psychic victory is won, the danger point will have passed. Faced by strength endowed with principle and meaning, the masters of the Kremlin will have to readjust their sights and set a new course. They might even discover that peace is a prosperous policy.

If unhappily this possibility should not come to pass, there would still remain the *Atlantic Alliance*.



Official U. S. Navy Photograph

PRYING INTO NATURE'S FROZEN SECRETS

At Point Barrow and elsewhere, the U. S. Navy Bureaus, the Hydrographic Office, and associated scientists are breaking into Nature's ice-locked mysteries.

MAN AND MATERIALS IN THE POLAR REGIONS

By GEORGE W. GRUPP

THE TERM "Polar Regions" conjures up images of daring explorers in grim struggle against great obstacles. It is as if the United States Navy explorers, such as Melville, and Peary fully visualized the importance of the Polar Regions. In the Polar Regions did not begin to take on their present aspect of importance until the development of the airplane and after the gallant efforts of Byrd.

That we have become aware of the importance of the Polar Regions we can only evaluate the Russians' lack of foresight in 1867, and the vision of a few American-like William Seward, because Alaska, this mighty country in the north, has become an increasingly important part of the United States.

Because of the want of much knowledge and understanding on things economic and scientific of the Polar Regions, the world's roads of tomorrow, our problem since has been to try to understand and cooperate rather than fight a losing battle of nature. And our present objective is to show large numbers of human beings to live and work in peaceful occupations in temperature areas without undue expense to property and without endangering human health and lives.

Even if it is true that there is still a great deal to learn before this objective can be reached to the full, yet the Office of Naval Research, the Bureau of Naval Ordnance, the Bureau of Yards and Docks, the Bureau of Supplies and Accounts, and the Hydrographic Office have been pursuing a program of research which has contributed considerable knowledge on the possibilities for the development of agriculture, of commerce, of industry, of natural resources, of transportation, and of conditions conducive to human survival, to normal morale, and to the working methods in low temperatures.

For example on March 21, 1944, the Bureau of Yards and Docks sent a reconnaissance

party of 4 officers to investigate petroleum development problems in Naval Petroleum Reserve No. 4, located in the neighborhood of Point Barrow, Alaska. Three months later an additional 2 officers and 5 enlisted men were sent to this area to intensify this investigation. And in August, 1944, a Seabee unit of 15 officers and 181 men arrived by surface vessels at Point Barrow with about 8,000 tons of supplies and machinery, including petroleum drilling equipment.

In addition to this petroleum exploratory venture, which is still a going project, the Bureau of Yards and Docks is studying what effect Polar Region conditions have on transportation, fuel oil efficiency, lubricants, and construction methods.

The Bureau of Supplies and Accounts, on the other hand, is investigating, developing, and testing non-flying sub-zero clothing.

The two well-equipped test stations at Point Barrow, which are under the general direction of the Office of Naval Research, are beehives of activity. Here scientists from Stanford University, Swarthmore College, Wood's Hole Oceanography Institute, and other private and public institutions are cooperating and aiding the Navy in its efforts to determine the effects of constant cold on man, materials, and machines, and to find ways and means of overcoming the difficulties. As a result, the Navy's scientists at Point Barrow are testing everything from man to machines, from clothing to lubricating oils.

To be more specific, at Point Barrow some scientists are hard at work studying the botany, climatology, geology, limnology,

AT ONE time a professor at Webb Institute of Naval Architecture, Mr. Grupp is a traveler, author, lecturer, and has been a writer for technical magazines and other publications since 1914.



Official U. S. Navy Photograph

LOOKING FOR OIL IN THE FROZEN NORTH

U. S. Navy Seabees moving oil well drilling equipment inland from Point Barrow, Alaska. Here the Navy is developing the world's farthest north petroleum reserves for future use in national emergency.

oceanography, and zoology of the Polar Regions. Other scientists are studying the effect of low temperatures on the use of different kinds of materials, and on the operation of various kinds of equipment.

Another group of scientists is studying the effectiveness of emergency rations, the effectiveness of electrically heated clothing, and the effect of low temperatures on man as it concerns blood coagulation, cardiac activity, hearing, sight, and general physical fitness.

Still others are at work to determine new and better ways of combating the insect pests during the warm months, to ascertain the effect of low temperatures on human effort and on the progress of construction

and other types of work, and to learn how the few hours of Polar sunlight during the cold months affect the progress of work and the morale of human beings.

These scientists have already compiled considerable data helpful to the promotion of human survival in the Polar Regions. It has been learned that survival in the Polar Regions demands that human beings be cooperative, dependable, resourceful, robust, self reliant, skillful, versatile, and not of the morbid and nervous types, even though radios and air transportation have penetrated the low temperature areas to prevent such persons being isolated mentally and physically from civilization.

Since coldness is productive of apathy,

lethargy, slowness, and clumsiness, and causes human beings to become depressed and discouraged, facilities must be provided to keep them dry and warm. Human beings must be trained in skilled occupations and in other interests in order to take their minds off themselves.

Suffering caused by the elements in the Polar Regions, or from accidents, may require hospitalization. When such medical and surgical services are necessary, recovery seems to be more slow because of the effect of Polar Regions on the morale of human beings.

During the summer months, the flies and mosquitoes also have an adverse effect on the morale of human beings. These pests fly into the eyes, ears, mouth, nostrils, and into any opening in clothing. For this reason body garments must be tied at the wrists, neck, and ankles. And nets must be worn over the head.

A careful study of work performance has revealed that the efficiency of human beings begins to decline at the average rate of 2 per cent per degree of temperature below zero Fahrenheit.

Since human beings can suffocate from breathing in air cold enough to freeze their lung tissues, the Navy is developing a new Polar breathing mask to overcome this risk.

Out in the open fields of the Polar Regions, drinking water can freeze to the lips. Whisky can paralyze the throat if it is consumed after it has been turned to a slushy ice by low temperatures.

To prevent the cracking and burning of lips, caution must be used in eating snow to quench thirst, for snow is the same temperature as that of the air. It should first be warmed in the hands to avoid freezing the mouth. It should also be allowed to melt slowly in the mouth and not swallowed in lumps if physical discomfort is to be avoided. And it should be eaten in small quantities if thirst is not to be increased.

Low temperatures always require a greater consumption of food to keep warm. For example, the crew of the U.S.S. *Midway* while in the Labrador Sea area (Expedition Frostbite), consumed 85 per cent more chocolate bars and 74 per cent more coffee

than it did while on the shake-down cruise in the Caribbean Sea. In a 1948 expedition north of the Arctic Circle, the standard Navy ration was increased 25 per cent. During very cold weather it may be necessary for the average human being to consume about 5,900 calories per day.

Normally, the Polar Regions are not any colder than the winter months in the states of Montana, Wyoming, and North Dakota where the temperature sometimes drops to minus 60 degrees Fahrenheit.

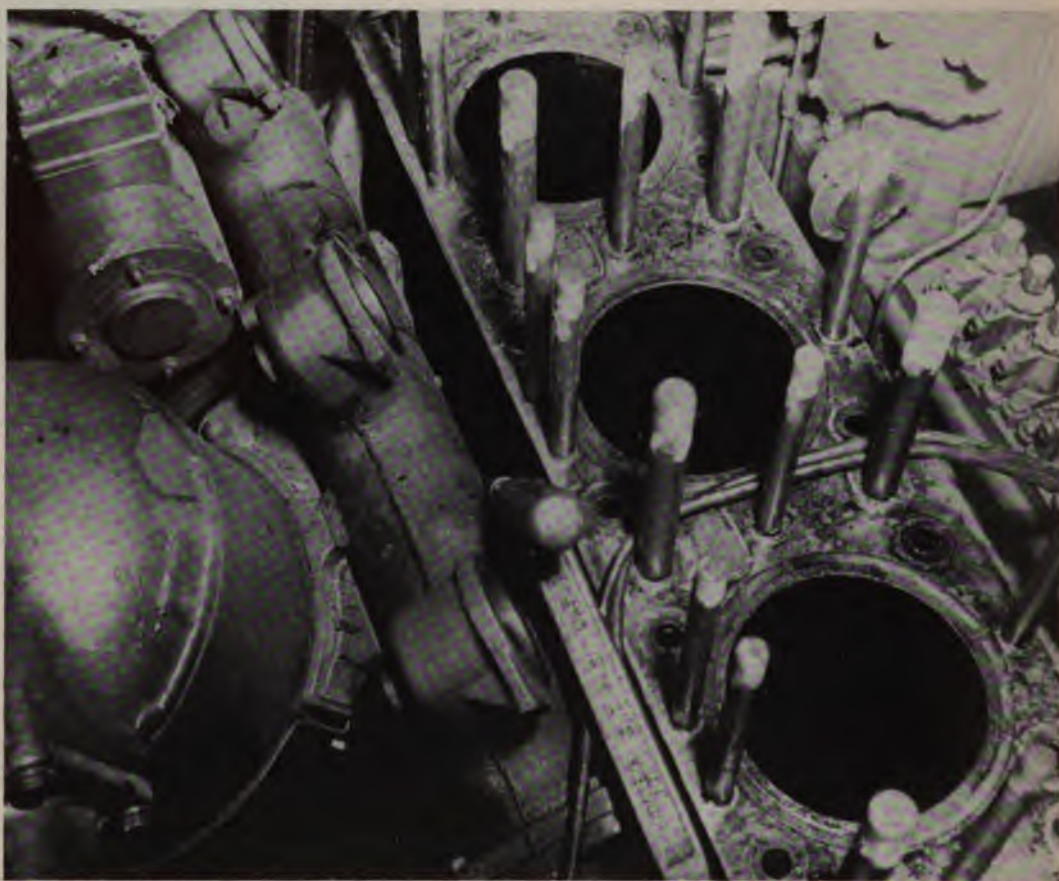
And since the thermometer is not sufficient to tell the degree of coldness felt by human beings, Dr. Paul A. Siple and Charles P. Passel, while in "Little America" formulated and calculated a wind-chill scale table. As the velocity of the wind increases, low air temperatures exert an additional strain on the human body. The Siple-Passel scale aids one in determining the additional amount of food calories required to maintain a constant body temperature. For example, a wind of 24 miles per hour at a temperature of 20 degrees above zero will chill the body just as badly as a mere 2 miles per hour wind at 30 degrees below zero.

Many experiments with different kinds of materials and designs are being made by the Bureau of Supplies and Accounts to find clothing which will provide the necessary durability, pliability, ventilation, warmth, and ease of movement needed for different kinds of work in the variable climatic conditions in the Polar Regions.

Clothing is one of the toughest problems. And while it is true that progress has been made, there is still much to learn.

The Eskimo, or native, clothing is not the answer to the problem. In the first place there are not enough caribou to provide clothing for a large number of persons. And in the second place, native clothing has been found to be too fragile when subjected to hard usage such as is encountered in construction work.

But even though the clothing problem has not been satisfactorily solved, nevertheless we do know from experience that Polar Region clothing should fit loosely in order to permit a layer of air to circulate around the body to vaporize the sweat from the body,



Official U. S. Navy Photograph

WHEN THE OIL FREEZES, THE ENGINE GOES HAYWIRE

Scored cylinder sleeves result from frozen lubricating oil. In the Polar Regions not only are special fuels and lubricants required, but batteries must be preheated as well as the engines themselves.

and to allow it to escape at the neck to prevent such moisture from destroying the insulating properties of flannelette pajamas, woolen underwear, and loosely knit string vests worn as underclothing.

The wool, or glass wool, inner lining of parkas and trousers is prevented from absorbing body moisture by an outer lining of rubberized nylon. Glass wool (or fibre-glass), is warm, light, and makes movement easy, but it has a tendency to break down and to form uncomfortable bunches at the elbows and knees.

Experiments have demonstrated that the insulating properties of Polar bear skins are inferior to those of Brooks Range Mountain sheep skins.

Clothing should keep one cool, and not hot. Dirty clothes matted by sweat lose

their insulating properties, hence clothing should be kept as dry and clean as possible.

Since flat surfaces are more easily insulated than tubular surfaces, the proper protection of hands and feet is a problem which even the Eskimos have not solved.

There are many things one cannot perform with mittens. The turning of a switch on the instrument panel of an automotive vehicle, the changing of a rubber tire, and adjustments which must be made on mechanical equipment cannot be made with cumbersome mittens. Such operations require bare hands even at the risk of frost bite.

The present type of Polar foot-gear makes it awkward to operate the foot-pedals of mechanical equipment. It is usually oversized because tight foot-gear makes feet

cold. At present the usual foot-gear is felt boots, or mukluks with felt socks and inner soles. As these are not completely satisfactory, experiments are being made with a rubber boot with an insulating air space.

Since Polar Region conditions present special problems, the usefulness of commodities, articles, and mechanical equipment is not the same as in the temperate zones. Building materials such as concrete and wood are to be preferred to stone or brick in the construction of foundations because they are better able to resist tension and shear stresses. Canvas loses some of its usefulness in low temperatures because it freezes and becomes unpliant.

And while ceramics are not affected by low temperatures, they are injured by sudden changes of temperature. Glass, like ceramics, is very sensitive to sudden changes of temperature; and when frozen glass is merely touched by a blast of warm air it shatters into small pieces.

Fuels, such as certain Navy specified grades of Diesel oil and gasoline, give satisfactory service under Polar Region conditions; but all fuel tanks must be insulated against low temperatures.

Lubricants are a real problem in the Polar Regions. Lubricants and fuels must be selected to keep corrosion at a minimum. For example, it has been found that when using certain lubricants the copper lead bearings of automotive vehicles fail after 1,000 miles of operation, because in low temperatures the corrosive blow-off gases condensing in the crankcases mix with the lubricating oil.

When lubricants become frozen in the steering apparatus, shift gears, brakes, and transmission gear, nothing moves until they are thawed out. Cold soaked engines with frozen lubricants are useless until they have been preheated. Even when the lubricant is only stiff, a fully charged battery cannot turn over the engine.

While it is true that dilutions have been used, nevertheless it is not recommended practice because the Diesel oil or gasoline may not burn off and may remain in the lubricant. This affects the lubricant's degree of viscosity.

A number of projects are in the process of operation to find an all-weather lubricant.

The tests being made during the winter of 1948-1949 may, or may not, have the solution to this problem.

Fan belts are apt to fail or crack in very low temperatures. For example, at minus 50 degrees Fahrenheit they become so stiff that they fall to pieces when twisted.

In low temperatures leather becomes stiff; it cracks, and it tears easily. Once it has become wet and freezes, it is no longer useful. To prolong the life of leather it must be given a protective coating of shoe oil on the rough side where the oil can soak into the pores.

Metals, like steel, become brittle in low temperatures. Under such climatic conditions steel should not be handled roughly for it will shatter under the blow of a hammer. And it sometimes fails when it is brought into jolting contact with permafrost. Steel, or any other cold soaked metals, should not be touched with bare hands because it may be impossible to remove the fingers without leaving some skin on the metals.

Tools which are used by repair men to make distributor, ignition, and injection adjustments and repairs should be covered with a protective coating because if the workers' hands are moist they will instantly freeze to the metal.

Because metals contract at different rates in the same low temperatures, precision instruments become unreliable when the contacting parts are of different kinds of metals and alloys.

At a temperature of minus 40 degrees Fahrenheit both untreated and water repellent textiles are still satisfactory. For example, nylon loses none of its softness or pliability, but at that low temperature hemp guy ropes would become stiff, hard, and perhaps snap.

While new rubber stands up well in Polar Region temperatures, yet it must be handled with care because once it becomes hard it easily chips and cracks. Rubber tires freeze solid, and develop flat spots, at minus 50 degrees Fahrenheit. Old rubber and synthetic rubber are not dependable in sub-zero temperatures.

Batteries must be carefully insulated with rock wool, fibre glass, or celotex because with hydrometer readings of only 1.125 they will freeze and burst at zero Fahrenheit. Polar



Official U. S. Navy Photograph

WHAT THE WELL-DRESSED MAN WILL WEAR

Types of clothing worn by the U. S. Navy in Northern Alaska. The Navy is making exhaustive studies to produce cold weather clothing that will not only keep a man alive but will let him work with the greatest possible efficiency.

Region low temperatures decrease the rated capacities of batteries because of the increased internal resistance. For this reason, at zero Fahrenheit batteries will produce only 50 per cent of their rated capacity; and at minus 40 degrees Fahrenheit they will produce only 20 per cent of their rated capacity.

In other words, the productive capacity of batteries falls so low at temperatures below minus 35 degrees Fahrenheit that even though they are fully charged they will be unable to turn over internal combustion engines before preheating. As a result preheaters are attached to the cylinder blocks of engines not only to warm up the lubricants, the engines, and the carburetors, but also to warm up the batteries to decrease

their internal resistance and to increase their productive capacity.

Obviously, to start internal combustion engines, preheating is essential at temperatures below minus 35 degrees Fahrenheit. Cold soaked gasoline engines cannot be started in a temperature of minus 40 degrees Fahrenheit if they have not been preheated for two hours at the rate of 250,000 B.T.U. per hour. Four hours of preheating at the same rate is required to start Diesel engines.

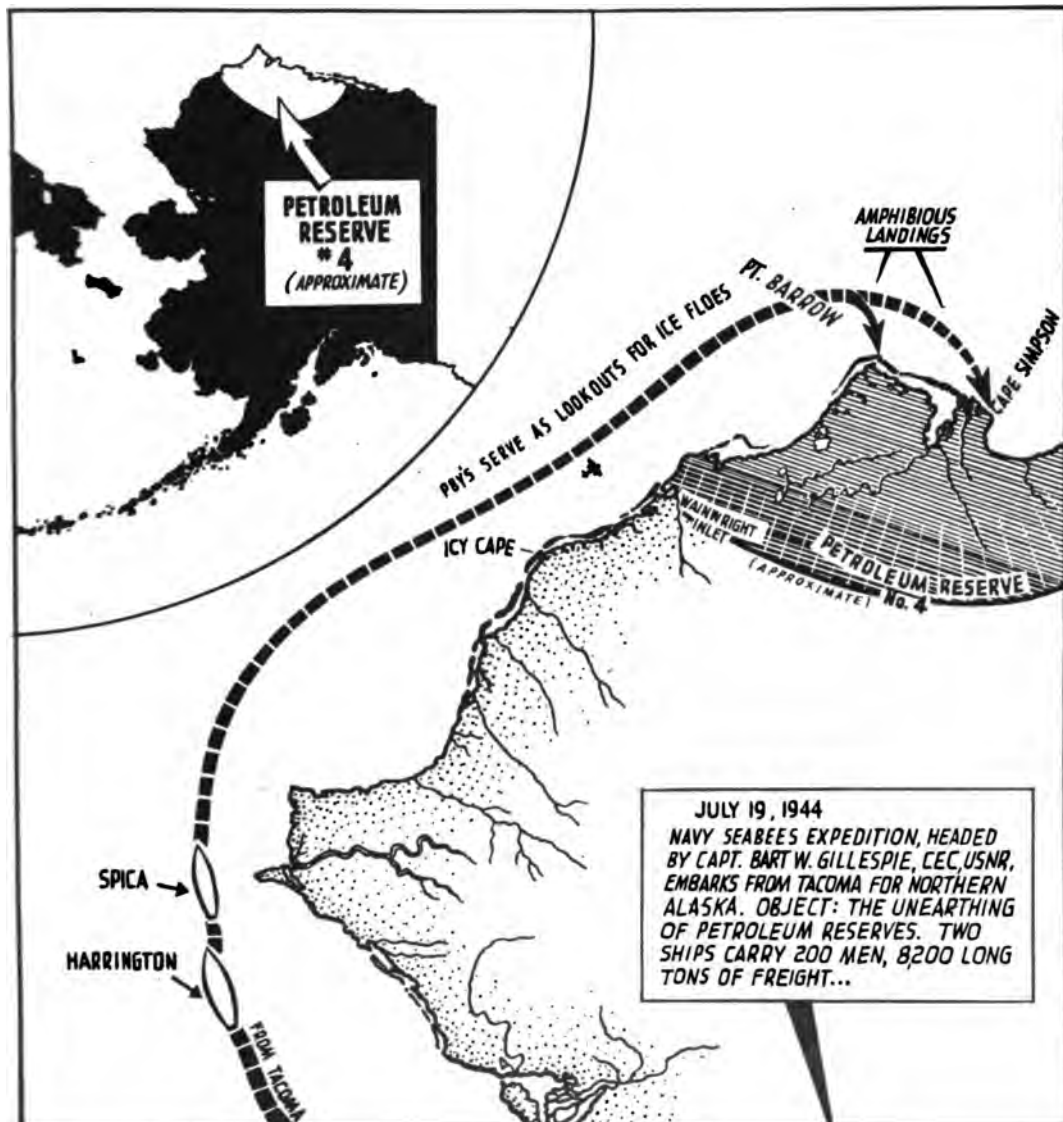
When the temperature falls below minus 25 degrees Fahrenheit, the electrical systems of automotive equipment become troublesome. For example, the insulation on wires begins to crack. Copper wire becomes very brittle. Spark plugs begin to foul. Distributor

condensers and rotors begin to fail. And voltage regulators become cantankerous.

Fixtures, fittings, pipes, wire, and other utility construction items, when used in the Polar Regions, must upon installation be adequately protected against frost, ice, and water. Faulty protection and negligence of the proper consideration of the thermal regime of permafrost will result in a costly

experience, for nature is an uncompromising, stern mistress.

To fight nature is futile, for in the end she always wins. She permits man and machines to survive in the Polar Regions if they co-operate with her and do not try to oppose her. To survive in the Polar Regions she requires simplicity in design, construction, and wants, and strict obedience to her laws.



Official U. S. Navy Photograph

MAP OF NAVY PETROLEUM RESERVE NO. 4

The heavy broken line shows the route taken by the Navy Seabees Expedition of 1944.



Official U. S. Navy Photograph

PLUNGING INTO THE SOLOMONS JUNGLES

U. S. Marines landing in the assault on Bougainville. Throughout the Solomons campaign, Chief Vouza and his native Solomon Islanders proved invaluable allies to the Americans.

JUNGLE ALLIES

by MAJOR JOHN L. ZIMMERMAN, *U. S. Marine Corps Reserve (Inactive)*

REE days after the Marines of the first Division landed on Guadalcanal, a strange group of men came out of the jungle and walked through the lines. It was a barbaric group, dark-skinned, bushy-haired and fierce-eyed. Two things about it impressed the Marines: the savages carried with them a young fighter pilot from the island, whom they had rescued and cared for when he crashed in the jungle; Vouza, the interpreter and spokesman of the party, spoke English.

These two details were of deep significance, although this was not apparent at the time. The incident of the rescue was one that was to be repeated countless times throughout the entire Solomon Islands campaign. It became almost axiomatic that a man who was forced to land within reach of the natives was as safe as though he were within the perimeter. The local natives, in consultation with the coastwatchers on duty along the island chain, maintained constant effective liaison with the Marines. Live and crew members were cared for and taken back to the Lunga area; in many cases the dead were buried in well marked graves and their effects returned to the Marine headquarters.

The fact that the leader of the group was a native did not, at the moment, mean anything to the Marines. It was the fact that he spoke English as well as it was spoken by the natives that impelled General Smith to direct all hands to treat all natives as friends bearing orders.

It was a wise decision. Within ten days the Japanese were a hero, and partly as a result of the heroism of the Second Battalion, First Marines, was able to throw back the first Japanese enemy counter attack. Vouza warned Lieutenant Colonel Edwin A. Pollock, the division commander, of the presence of a newly arrived enemy force immediately after it struck his lines. And from that time on the Marines trusted the natives im-

plicitly and received their loyal support.

The campaign had begun under the severest of handicaps, not the least of which was an almost total lack of information about the target area. Such maps as existed were few in number, sketchy in nature, and badly out of date. Personal information, while it was freely given by those who possessed it, was hopelessly limited by the fact that former residents of the islands, or visitors to them, had first-hand knowledge of only very small portions of the coastal areas and almost no usable data about what lay inland. Not one officer in the First Division had been in the area prior to the war, although Captain Guy Richards, a pre-war visitor, joined the Division at the close of the operation.

The rest of the division knew only what it had read in the lurid tales of Jack London, and it is fair to assume that those who thought about the matter at all expected the natives to swing down out of the trees, festooned with human skulls and shooting poisoned arrows.

The only ray of light that shone through the black intelligence fog came from the coastwatchers. The story of that intrepid band of dedicated men has been amply told by Commander Eric Feldt, R.A.N.R., in his work entitled *The Coastwatchers*. The continued existence of these men behind the enemy lines, to say nothing of their ability to spy upon and report the activities of the

A GRADUATE of the University of Minnesota, Major Zimmerman enlisted in the Marines in 1940 and was with the 6th Marines in Iceland in 1941. Commissioned a first lieutenant in 1942, he served as a language specialist with the 6th Marines during the closing phases of the Guadalcanal campaign. Invalided home with malaria, he was subsequently attached to the historical section at Marine Headquarters.

enemy in their areas, depended directly and wholly upon the loyalty and good faith of their native assistants.

Their loyalty was so amply demonstrated that it would be laboring the point to discuss it here, and the reasons for it are based upon so many imponderables that a full treatment of them would fill a treatise. The following incidents are presented in the hope that they will serve in some small way to round out the picture of native help. It will be seen that certain qualities are taken for granted in addition to loyalty: friendliness, humor, superb physical attributes, and an innate love of fighting that two generations of *pax Britannica* have not been able to root out.

Of necessity any discussion of the Guadalcanal native during the war starts with Vouza. When the Marines landed, he was about 47 years of age, a retired Sergeant Major of the local constabulary who had recently "gone out on 25" and had been appointed headman of the Tasimboko District, which lay east of the Tenaru River. A native of that area, he had travelled far during his years of duty, having served all up and down the Solomons chain as well as in Vanikoro and other islands in that vicinity. His reputation among both the British and the natives was great, and his espousal of the American cause made it easy for the Marines to secure the services of the rest of the native population.

The feat of heroism which brought him the Silver Star from the United States and the George Medal from Great Britain was performed at his village, which lay several miles east of the perimeter and some distance inland. After he had established contact with the Marines and after Major Clemens had come in from his post in the mountains, Vouza went home to get on with his task of helping his new friends. On August 19 he was captured by a Japanese patrol from the newly landed Ichiki unit.

There are various accounts of how he happened to be picked up while the rest of his village was relatively unmolested. One version says that he was wearing or carrying an American flag, a swashbuckling gesture that does not seem to be compatible with Vouza's canny nature. Another, and much

more likely, tale is that he was smoking American cigarettes. By far the most plausible account, however, says that the enemy patrol was led by Ishimoto, a Japanese who had worked for some time at Tulagi as a handyman. Ishimoto knew Vouza.

The rest of the tale has an epic simplicity and ferocity. Vouza was tied to a pole in the full sun, in his own garden. For a full day he was beaten, questioned, and kept without water. He remained obdurate, for, as he said later, "I remember how they tell me always be faithful to my King. I think about how naughty I was . . . and how much trouble I cause Government. So I tell myself this time I do something good for my King to pay him back for all that Trouble."¹ No finer apology for loyalty has ever been uttered.

At last the Japanese, despairing of breaking down his resolve, stabbed him several times and left him for dead. That was just at sundown, and the enemy, a detachment of the Ichiki unit, must have been anxious to rejoin the parent body, which was to attack that night.

Vouza worked himself free, arose, and made his way, in the dark, through the jungle and the grassy plains that lay between him and his new friends. In doing so he passed through the enemy force of 900 men. He arrived at Lieutenant Colonel Pollock's command post about midnight, warning him of the approach of the enemy unit. Ichiki's insane attack was launched shortly afterward. It was repulsed, and the Japanese unit was wiped out.

After the episode, Vouza went to work in earnest for the Americans, for now he had a personal score to settle. Again I quote him, this time in his own words, and as I do so, it seems to me that Vouza, the stone age man, has in him something of the gift of expression that was in the Homeric Greeks and in the compilers of the old Norse sagas. The quotation comes from a letter he wrote to Hector MacQuarrie,² who had known him

¹ Taken from *Among Those Present*, a British Government publication.

² Author of *Vouza and the Solomon Islands*, reviewed in the Naval Institute PROCEEDINGS. I am indebted to Mr. MacQuarrie for making available to me this letter, which was dated at Camp Honiara, Guadalcanal, in the Spring of 1948.

twenty years before, when he was a Lance Corporal in the Constabulary.

Well I was caught by the Japs and one of the Japanese Naval Officer questioned me but I was refuse to answer & I was bayoneted by a long sword twice on my chest, through my throught & cutted the side of my tongue & I was got up from the enemies & and walked through the American front line & there my officer Mr. Clemens who D. O. at Guadalcanal during the war, later he is Major, & his clerk, a native of New Georgia he was Staff Sgt his name was Daniel Pule. Both got the repots information from the Marine Division at the Front Line by one of the Colonial of the Marine Div, his name was Col Buckley that I was wounded. So then boths Major Clemens & Staff Sgt D. Pule they came up to the front line & took me to the American Hostpital at Lunga Guadalcanal & there they done the treatment & the wounded was healthed up, only 12 days I was in Hospital.

After I was discharged from the Hospital I wad do my fighting with the Japs & paid back all what they have done with me & now, here I'm I, still alive today . . . and I received your letter that's made my heart so delightful . . ." (Mac-Quarrie had written him to tell him of the book in which he appeared.)

Vouza, as he says, did his share of fighting and paid up his score in full. In fact, he kept on paying it until December, 1944, when he ran across a Japanese who had been hiding out for two years in the mountains, raiding the gardens and molesting the women. The results of the meeting were both tragic (for the Japanese) and comic (for the American troops near the coast). Vouza reported the incident to an Army officer, who brushed it off as being fantasy. It is fair to say that the officer was new-caught from the States and did not appreciate Vouza's standing.

Vouza departed with a look in his eye, and next day he reappeared, this time with a helper who carried a large sack. Searching out the same officer, he saluted, turned to his companion, and spoke sharply. The helper up-ended the bag and a large Japanese head rolled out at the feet of the now convinced American.

Vouza's last combat assistance during the actual campaign seems to have been given when, assisted by Tabasui, a Malaitan scout, he guided the Second Raider Battalion through the first stages of its famous

30 day patrol. Thereafter he acted as a liaison man between the Americans and the natives.

Four days after Vouza's first appearance, Major Clemens came down from his post in the mountains with a retinue of scouts and constables. He had been on the island since the coming of the Japanese to Tulagi in May, and he had remained away from the scene of the Marines' landing until he was sure that it was not merely a raid. He offered his services and those of his men. His knowledge of the terrain and of pidgin English, the *lingua franca* of the area, made him invaluable to the Americans.

Thereafter, almost every patrol that went far from the perimeter—especially into territory not previously covered—was accompanied by native scouts. These scouts were of prime importance because of their fearlessness, their thorough knowledge of all trails, and their ability to move swiftly and silently. It was because of the assistance rendered by such men, for instance, that an enemy coastwatcher station on Cape Astrolabe, Malaita, was wiped out by a patrol operating out of Tulagi. A similar debt was incurred when nine native scouts undertook to destroy a similar installation at Cape Hunter, on the south shore of Guadalcanal. Almost the first casualty suffered by the Second Raiders was that of Poi, a scout, who was wounded in both arms as he acted as a point for the advancing battalion. The initial successes of Carlson's Raiders were made possible because of the fact that their supplies were carried inland to them, from predetermined points on the coast, by parties of native bearers under Marine protection.

Native assistance to the American cause fell into two classes, combat and labor. The combat missions were undertaken and carried out generally by native constables—"police boys," as they were called—and by trustworthy locals who had a taste for warlike activity. Such local people also contributed much valuable information of enemy troop movements, particularly in the period preceding November, when Japanese landings to the east of the perimeter were not unusual and frequently undetected by the Marines.

The great contribution of working parties

did not begin until the combat activities began to center more and more along the western flank. This will be dealt with later.

The official mission of the police boy was to preserve law and order—a relatively simple task among the comparatively peaceful Nggelese people who inhabited the plains near the Lunga and the Tenaru Rivers. When the occasion demanded, however, they were able to slough off the imposed cloak of mildness and revert to their ancestral savagery. Consider, for example, the tale brought back to the perimeter in October by Saku, a police boy. Saku, reporting to Major Clemens after returning from a scouting mission, said,

On the fifth of October I was with Torovua of Sunahavi, and on our patrol we saw a party of ten enemy by the Belaha River.

They had piled arms on a rock and were busy getting wild nuts to eat. We cut across the river and took their rifles and hid. When they returned we saw that they were not armed and we closed in on them. They picked up stones to defend themselves, and as we did not want to give things away, we finished them off with axes and spears.

On the sixth of October we looked for the rest of them. We saw nine more of them, again by the river. They again left their rifles and we dealt with them in the same manner. . . . We saw some enemy tracks in the morning and heard a shot. I sent two boys on and they saw a party of twelve, all of whom had rifles. My two boys came back and reported to me. We then went down, twelve of us. We went and hid and surprised them at close range. They tried to shoot us, but we caught hold of them and killed them

Other tales are told of how the local people, who originally only asked to be left in peace in their gardens and villages, at last became so infuriated that they set upon small Japanese patrols and parties of survivors with only their crude agricultural tools and improvised spears. The number of enemy who disappeared noiselessly in the jungle will never even be estimated.

Although it had been thought as early as August that advantage might be taken of the willingness of the natives to work for the Marines, the problem of escorting them in large numbers to the perimeter—and of subsisting them once they were there—could

not be overcome at the time. Several attempts to bring groups in were abortive, and it was not until November 1, that 200 laborers came into the Marines' positions.

Once the technique of enlisting them, bringing them to the perimeter, and establishing them in their own quarters was mastered, however, there was a steadily increasing number of them available. By November 10 over 400 were present, under the supervision of the Division Intelligence section. Since they were volunteers, and since it was realized that only by respecting their status as such would it be possible to guarantee a steady supply of workers, the natives were free to return to their villages at any time.

The services rendered by what was affectionately known as the "Cannibal Battalion" were invaluable, according to reports submitted by Colonel Buckley. Considerable anxiety was felt by Group Commander Charles V. Widdy, R.A.A.F., an old-time planter and resident of the islands, when it was decided to pay the local help at a rate far exceeding the pittance which they had been accustomed to receive under the British rule. This pay was given them through the Intelligence fund of the First Marine Division, since it was possible, by elementary logical acrobatics, to arrive at the conclusion that keeping the natives loyal and happy was primarily a counter-intelligence function.

Anxiety was also expressed by the medical personnel of the Division. It was thought that the presence of so many natives, all of them infected with malaria, near the Marines in an area infested by *anopheles*, would make certain what was, at the time, only highly probable—the infection of the entire command with the disease. The obvious validity of this point of view could never be established. The command did fall prey to the infection, almost to a man.

Widdy's gloomy forebodings, however, were borne out by later events, as we shall see below. There is much evidence to show that the impact of increased pay and an infinitely greater variety of goods than they had imagined to exist was far too heavy a one for the native to absorb. Among the stone-age locals the whole matter of the

arrival of great ships over the horizon, bearing desirable goods, ultimately gave rise to a strange "cargo cult" whose devotees now look forward to a time when their coming will be resumed. They endeavor to speed the return by ritualistic means, which at last report have not proved efficacious.

The number of anecdotes which came out of the association between the natives and the Marines is enormous. It doubtless has its counterpart in legends even now being handed down in the villages near which the great battles were fought.

Some of the anecdotes brought back by

the Marines give an insight into the native mind, which was by no means as simple a thing as it seemed to be.

There was, for instance, the question of why the natives hated the Japanese. It clearly could not have come from the mere fact that the British and the Japanese were at war. Warfare between villages and communities was almost a normal condition in a great part of the islands, and the taking of sides gratuitously seems to have been unheard of.

When I arrived on the island early in January of 1943, I had the good fortune to meet almost at once a young local native,



Official U. S. Marine Corps Photograph

TOUGH GOING IN THE SOLOMONS

In sniper infested jungles like this, Vouza's natives brought the immeasurable contribution of jungle lore.

almost blue-black, with a handsome and intelligent face. He spoke perfect English, learned in mission school.

Beli told me that when the Japanese first came, the natives were not sure how to receive them. Their coming had not been accompanied by violence, since the tiny token force of British and Australians had fled the area the day before their landing, and the priests and nuns at the various missions around the coast had not been molested at first. For a while it must have seemed to the local people that there had been merely a change in the color of the masters' complexion, for the newcomers began by recruiting labor and paying well. Immediately, however, they made two serious mistakes.

They first began to set up their own hierarchy of chiefs on the basis of the degree to which the individuals cooperated with them. This artificial and, to the native mind, unjustified tampering with traditional matters, disturbed the local people. When a portion of the pay they received was retained as "taxes," there was a marked rise in feeling. The molesting of women, which seems to be an inevitable part of the progress of any invading force, fanned the natives into open enmity. This was made implacable when the Japanese, instead of picking fruit as it was needed, carefully, from the parent plant, would cut down a papaya tree for the sake of securing one fruit or pull up a whole vine to get one tomato.

Beli pointed out, gravely, that all this just didn't make sense, and I agreed. I also wondered, as he spoke, what would have been the result if the Japanese had taken another tack—the tack which the Marines took, for instance. I looked at Beli's handsome savage face and his ebony muscles and decided that I was glad we were fighting a stupid enemy.

The Japanese were stupid, indeed, and the highest and purest example of this attribute is found in the order issued by an enemy commanding officer who directed his troops to kill at once any native that they saw.

Beli, in addition to his function as a point of contact between my mind and that of the local native, was a bringer of much enjoyment. One day, for instance, he and I were sitting on the deck of my tent, when a

fellow officer opened the flap and walked in. He was a man of high repute in the regiment, for once on a time he had made a trip through the island group and he retained much wisdom from those days, including a smattering of pidgin English. Seeing young Beli, the captain drew a deep breath and exercised his rare skill. Beli looked a little surprised, but he answered him, courteously, in kind. Then he lowered the boom.

"But Captain," he said gently, as to a misguided boy, "we think that sort of speech is very old-fashioned these days."

The captain never forgave me, for he thought the whole thing was a put-up job.

Then there are the numerous tales that are told of big Alan Piva, a golden skinned youth from Ontong Java, who in some unexplained way found himself in Guadalcanal and who attached his services and affections to Edmund Buckley, the Intelligence Officer of the First Division. So assiduous were his services, indeed, that Buckley received much acid comment from General Vandegrift and his staff because in spite of rain, mud, and the general hellishness of the surroundings, he always appeared in freshly laundered khaki and with his field boots indecently well polished. In some way—Buckley is smugly silent on the matter—Piva secured for him an authentic mattress and guarded it against acquisition by higher ranking officers. One day, after it had been blown to bits by shellfire—without Buckley in it, fortunately—Piva recovered and sewed together all the tattered fragments.

Early in 1945, when my duties as historian took me again to the island for the purpose of studying the terrain, I assumed the extra duty—a pleasant one—of visiting Vouza in his village. By this time the hero had reverted to retired status with the additional duty of Headman of the Tasimboko District.

In order to travel quickly and safely, I secured from the British officers at Camp Honiara the services of a police boy, Lucius Lole, of Malaita. This handsome, tattooed, fierce looking youngster repaid me for his upkeep before we had gone a mile from his camp. I noticed that whereas Major Saunders, who had lent him to me, spoke to him in pidgin, Lole and I had been talking steadily in English, which he spoke per-

fectly. I asked him why Saunders hadn't used the authentic article.

"Oh, well, he's a British officer, you know," said Lole, tolerantly.

"Um-m-m. Do you have to use pidgin with your work?"

"Yes. With all the local people."

"Why is that? Don't you understand their language?"

"They don't understand *mine*," answered Lole.

I have been pondering all the nuances of that answer for nearly four years.

We met and were welcomed by Vouza, at 50 years of age an upright, vigorous, smooth muscled man with a face of chiseled granite. His eyes were something equidistant between fierce and kindly, and he was listened to with respect by his people. Even young Lole, of a tribe traditionally at war with Vouza's people, treated him like a favorite uncle.

When I decided to leave, and set the time of my departure as the next morning, I asked Vouza that only a cup of coffee be given me so that no one would be inconvenienced. He looked at me.

"Captain, you will have papaya and bread and salt and *kumara*," he said in his retired-sergeant-major-Tasimboko-headman voice, "And coffee," he added, "to make you strong for work."

When the last of the American forces left the island, the jungle began to nibble away at the edges of the airfield and the roads, the great copra companies returned to pick

up their business where they had dropped it. At once it became apparent that Widdy's dim view of the future had been uncannily accurate. A strange movement, known as the "Marching Rule," began among the local people. Vouza himself seems to have been involved at first, for in the same letter to MacQuarrie which we saw above, the following lucid statement appears:

This thing it happen during the Year or more ago, they called this meeting Marching Rule. I was mix up with this meeting and being went with them & soon I found myself that it is have no roots as a tree, so I don't want it . . . so now the Government is friendly with me at present.

The "Marching Rule" had as one of its talking points a series of demands upon the British. There was a demand for increased wages, for example—the equivalent of \$48.00 per month was wanted, an increase of something like 400 per cent. Increased supplies and variety of food likewise were asked; and until such time as all demands were met, the locals refused to work. There is something faintly reminiscent in all this for an American, who automatically looks further down the list for the mention of improved working conditions.

The demands have not been met, to date, and the copra crop lies in utter ruin. The natives are getting restive—as are their distant cousins in New Guinea—and Malaita, the traditional home of trouble and violence, has withdrawn into its shell and refuses to permit ships to land on its shores.



ONLY A LANDLUBBER

Contributed by REAR ADMIRAL WILLIAM J. WHEELER,
U. S. Coast Guard (Retired)

It appears that a flagship of the Navy, some decades ago, was being informally visited by the President of the United States, one of very portly frame and determined mein, and one noted for his unsparing use of veto prerogative.

A typical old shellback inquired, "Who is that big old guy who does not take the trouble to doff his peak to the Commodore?"

A shipmate replied, "That is the President of the United States."

"Well, President or not, I should think that he would have manners enough to salute the quarter-deck."

"How would you expect him to know anything about manners when he was probably never out of sight of land in his life?"

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS).



Official U. S. Marine Corps Photograph

A MARINE'S MAIN JOB IS AMPHIBIOUS WARFARE

These Marines wading ashore from an LCI at Cape Gloucester apparently represent the simplest definition of amphibious warfare, but their way had been prepared by Naval bombardment and their objective was a strategic, much-bombed airport, later to be used by the Air Force.



Official U. S. Marine Corps Photograph

THIS WAS AMPHIBIOUS WARFARE PAR EXCELLENCE

Supported by tanks, Marines stage a frontal attack on Japanese positions in the craggy ridges of northern Iwo Jima. The strategic importance and tactical use of Iwo Jima derive from B-29 and aircraft fighter ranges, but it took the costliest man-to-man combat to secure the island.

THE RIDDLE OF COMBINED ARMS: 1949

By MAJOR GUY RICHARDS, *U. S. Marine Corps Reserve*

ARS not only bring cruelty and heroism, victories and defeats. They speed discoveries of all sorts, both and benign. And they produce mirage in the minds of military planners new ideas about future wars.

g these new ideas are often a few and grand illusions. One of the n recent times is that of the Pushbutton War, a concept that began to gain in the afterglow of Hiroshima and which seems to have a special on for many Americans. In my the Pushbutton War ranks with Mississippi Bubble, the Loch Ness , and the Cardiff Giant.

oax has been made doubly effective nited States because there seems to uch to support it in the shadowland cience and fancy meet, a region attractive to romantic artists and lers; and secondly, because it apone of our most admirable traits—ty to make newer and better prodn others.

ability to create new marvels has o make our nation, but it could alsoreak it. Unless the imagination that machines has the ability to apthem fully, to see the pitfalls as well otentialities, those same machines ce a mental disease as surely as some can poison blood. Call it anything —“Pushbutton Philia” or “Jules eurosis.”

bly the worst of all the effects of ase are in the realm of morals. It up the philosophy of “Let George Do n attractive cellophane wrapper that if modern progress. When “George” ed as a feelingless robot or rocket, e made up mainly of machines, the ion to hand the job over to him can almost irresistible.

ubstitute for the fighting man that

seems capable of doing our dirty work without peril or sacrifice is bound to be popular until that moment of terrible disillusionment when it is proved a fraud. At that moment, and at the eleventh hour, and after nearly everyone had put faith in “George” and based all our plans on him, the fighting man has to take over.

Then it can truly be said to have done more harm than good. For every psychiatrist and every troop leader knows that disillusionment is a primary cause of demoralization. And demoralization is a primary cause of defeat. The decline and fall of the Roman Empire came after utterly cynical mercenaries were sent to do the job once done by Empire troops. In many ways the modern search for military substitutes is just a search for another mercenary.

Regrettable though it may be, you just can't buy the kind of talent needed to prevent a great nation from becoming a has been. A workable Maginot Line will never be put on the market.

The Pearl Harbor and Guadalcanal of the next war could be anywhere. They could start in Alaska. They could open with a riot in Downtown Manhattan. They could be launched by a bombardment, atomic or otherwise, of one or more of our West Coast cities. Or we could find that our first job was to rush a force to a foreign shore to retrieve

A GRADUATE of Yale University, Major Richards was an explorer for the American Museum of Natural History in New Guinea and the Solomon Islands before the war. Joining the Marines after Pearl Harbor, he served as a Patrol Officer of the First and Second Marine Divisions in the Solomons, Cape Gloucester, and Talasea campaigns. Inactivated, he covered the Luzon and Mindanao campaigns as a war correspondent. After the war, he returned to the Marines in connection with a writing project; currently he is on the staff of the *New York Journal American*.

American hostages held by an aggressor on the rampage.

In the face of these truths some reputable spokesmen have made so bold as to say: "Leave it all to airpower." Or "The next war will be won by rockets, robots, and guided missiles." Or "Atomic bombs will have decided everything in a matter of hours." Or "Naval power and naval beach-heads belong to the ancient past. The beach-head of the future will be the captured enemy airfield."

What are the facts?

If we went to war tomorrow the pack mule of our strategic airpower would be slightly improved models of World War II bombers with operating radii of about 2,000 miles or less. To be effective against most foreign targets they would need foreign bases. Most of these bases are not now in our possession. Many of them might be in enemy hands from the very first day of the war.

Could these foreign bases be seized, held, and supplied by airpower alone? The facts argue convincingly that they could not. A great many partners in the components of land, sea, and air warfare would have to combine to take those bases and hold them against all attempts to throw us out. I shall discuss the role of the other partners shortly, but first I should like to dwell on one whose job I am most familiar with—the Marine. In the easy-does-it type of global thinking so current these days there are many gaps to be filled in and one of the most important gaps is left to the Marine Corps.

A Marine's main job is amphibious warfare. That is the chief mission assigned to the Corps by the National Security Act of 1947. From constant usage in the last few years the phrases "amphibious warfare" and "amphibious forces" have been shorn of much of their real meaning for many Americans. To some, for example, the former phrase simply means a campaign that starts with a trip in smallcraft from ship to shore. To some the latter means any expedition of land units engaged in any overseas campaign.

Actually both phrases refer to the result of a very complicated blending of naval, air, shipbuilding, engineering, infantry, artillery

and chemical warfare techniques by which an assault force has been able to overcome the barriers of ocean, reef, surf, swamp and sand and—against strong opposition—win a perimeter ashore. Sometimes a small beach-head suffices for this perimeter; say a beach-head which includes an airfield. But often it has been necessary to keep the defender off balance by pursuing his forces far inland.

Techniques for successful amphibious campaigns took years to develop. Powerful amphibious forces are still a comparative rarity among the nations of the world. Though many other nations have navies, and some have marines, no other nation has a Navy-Fleet Marine Force team like our own, which can command all the oceanic approaches to all the coasts of all the continents and has the additional power of landing on those coasts and/or the islands off those coasts. The significance of this capability was borne out by all our landings in the Pacific, North Africa, the Mediterranean, and France. And the significance of not having this capability has been as heavily underlined in recent history.

It was for lack of an equivalent to our Fleet Marine Force that the British were unable to consolidate landwards their naval conquest of the harbor of Narvik. It was the same sort of deficiency that prevented the Germans from making a landing in England across the English Channel.

Only Japan's mastery of some of the basic problems of amphibious assault enabled her to fan out in so many directions over water to grab a short-lived war empire that ranged from the Philippines, the Malay Peninsula, and the Dutch East Indies as far east as the Marshall and Gilbert Islands. And only our own much more complete mastery of this type of warfare enabled us to defeat the Japanese and win the islands from which our B-29's struck at their homeland.

The Marine Corps has passed on, in its planning and thinking, to many improvements on the methods used in the last war. But until the power and ranges of new weapons have passed far beyond their present capacities we know we cannot ignore certain rules of air and sea logistics which the last war reemphasized. Not when the planes bearing our air power are destined for some

time to have very much the same limitations. Not when amphibious techniques which put all our weapons in the global-range class may have to be used again under very much the same circumstances.

Put it this way. There is no plane, rocket, guided missile, artillery piece, mortar, rifle, or machine gun which has a global range. There will be none in the foreseeable future. Yet when one or more of these weapons are carried forward by the long arm of our amphibious striking power thousands of square miles of the earth's surface are suddenly moved into their range. All the coasts of all the continents become potential target areas for our naval rifles, rockets, carrier aviation, artillery, and even for the infantrymen's rifles and machine guns. A 500-mile-wide band inside all the coasts of all the continents becomes a potential target area for our carrier aircraft. A series of 2,000-mile-radius arcs, reaching inland from all the peripheral islands on all the continental coasts, define the potential target area of our strategic air power. The preponderance of these islands is such that almost anywhere in the world can be reached by one of these arcs.

In addition, as we proved in Europe, the Philippines and Okinawa, we have developed the means of building up our beach-heads to provide momentum for launching land armies and air power far inland.

Our amphibious power is, in fact, a pair of globe-trotting boots that can be slipped onto all our weapons. Its capacity to extend their ranges for thousands of miles is not a flight of fancy or a bit of optimistic conjecture. It is cold fact. It has been tested over and over again in battle. It is the result of generations of increasing coordination between the different arms; so before we go overboard about new conceptions of warfare, and before I answer in detail the arguments of those who say we'll never need it again, it is well to take a little closer look at the one global weapon already in our possession.

Experiments in teamwork and the crossing of a classic no-man's-land are the two big stories behind the creation of American amphibious doctrine. How this came about is too long-drawn out to recount here, but

there are themes in it of abiding value to all Americans.

Various degrees of coordination between different arms goes back as far as the use of the spear in one hand and the shield in the other. The Nineteenth and Twentieth Centuries brought integration among infantry, artillery, and armored vehicles in the land armies, and among such sea weapons as the naval rifle (surface ships), torpedoes (surface and sub-surface), and bombs and rockets (surface and air).

Until 1932, however, the advance of teamwork among the arms had always stopped abruptly at the barriers that divided the responsibilities of the Army from those of the Navy. Those barriers were the reefs, surf, shores, swamps and beaches where the land and sea joined. No army had ever mastered the military problems of passing through these barriers. Though the American Navy-Marine Corps team, in 179 landings since 1776, had made some progress with the problems, not all of them had been solved. So those barriers remained the natural division wall between land and sea forces all over the world. On either side stood the men, weapons and teams that comprised the two. The Army had its own subordinate air arm. And the Navy its fleet aircraft.

Starting in 1932 the Navy and Marine Corps went all out to overcome three deficiencies that still prevented the Corps from bursting through the barriers. These deficiencies were:

1. The Corps did not possess landing craft and amphibious shipping capable of carrying men and equipment over reefs, through surf and onto a beach-head, against heavy opposition. Its landing doctrine was based on highly vulnerable ships' boats regularly carried aboard naval vessels.
2. It did not have a well-worked out amphibious technique for disembarking men, weapons, equipment and supplies under fire.
3. It was not an integral part of the fleet.

The Fleet Marine Force resulted from correcting these deficiencies. A unique creation, and without an exact parallel anywhere, the Fleet Marine Force is a ready striking arm based on closely-knit doctrines of air support, naval gunfire support, attack transports, armored amphibious vehicles, and all

the other devices and landing craft for crossing reefs, surf, swamps, and beaches against strong opposition.

In the decade between 1932 and Pearl Harbor, the Corps, with the collaboration of the Navy and American industry, overcame its deficiencies and solved the problem of beach-head assault. It thus fell to the Navy and the Corps to cross the no-man's-land that had separated the organization of armies and navies. Although it was the Marines' good fortune to inspire a new teamwork and cooperation among the services, it has not had a monopoly on it, however. Quite the contrary. The crossing of the no-man's-land set in motion a chain-reaction in favor of teamwork that rose to a climax during the last war.

It was the Air-Armor Team that put General Patton's Third Army on the rampage in Europe. It was the Air-Naval-Ground Team that got Allied armies ashore in North Africa, Sicily, Italy, Normandy, and Southern France in strength sufficient to defeat all opposition. It was the Air-Naval-Ground Team that brought the conquest of the Marianas, Philippines, and Ryukyus and poised our heavy bombers over Japan.

All these victories were truly notable. They marked this nation's coming-of-age as a global power, a power that had learned to wrap, pack, and stow on shipboard, and to deliver from shipboard, the land, sea, and air strength necessary to overwhelm strong naval, ground, and land-based air forces. For whenever we struck out of range of our own land-based tactical air power, as we did in the Western Pacific, the margin of difference was made up brilliantly by carrier aviation.

The team principle unified the armed forces in the heat of many battles and in the comradeship of many victories long before the drive for unification reached the halls of Congress. I am convinced that the lessons it taught us in the last war provided the impetus behind the will of Congress and the American people that resulted in the National Security Act of 1947.

I am also convinced that this team principle makes an enormous amount of sense to several million veterans of the last war

who fought at the level of landing craft coxswains, tankmen, artillerymen, riflemen, machine-gunners, assault engineers, mortar-men, anti-aircraft gunners, signalmen, and crews of tactical and strategic air squadrons.

Now let's deal with the arguments that our amphibious forces and our fighting teams are obsolete conceptions—that there is a "George" who can do what they did better than they did it, and at a cheaper price in human life.

Let us suppose that we were attacked by an Eurasian coalition. Let us suppose it was our job to carry out quick and decisive counter-measures along the lines suggested by General George C. Marshall when, in 1945, in his report as Chief of Staff of the Army, he said:

"If this nation is ever again at war, suffering as Britain did in this war the disastrous attacks of rocket-propelled weapons with explosive power like our own atomic bomb, it will bleed and suffer perhaps to the point of annihilation, unless we can move armies of men into the enemy's bases of operations and seize the sites from which he launches his attacks."

Could such missions be carried out exclusively by airpower? Could they be carried out exclusively by airpower and airborne troops?

Decisive negative answers to both questions can be found in a factual analysis of the problems involved in seizing and holding distant, strongly-defended bases. A look at the map will show that only a portion of the advance bases needed to blanket Eurasia with 2,000-mile-radius arcs, in other words to reach all of Eurasia with our long range airpower, could be expected to be in friendly hands at the outbreak of hostilities. Several advance bases in several sectors of the continental periphery would have to be taken. Probably they would have to be taken from the enemy and/or his satellites. Once taken, they would have to be prepared for launching a major aerial offensive. And they would have to be quickly fortified against counter-measures.

Let's get down to cases. Island "X" must be captured in a hurry. It is 150 miles off the Southern Eurasian Coast. It is about 6,000 miles southeast of New York. It is



Official U. S. Coast Guard Photograph

ROLLING IN THE OIL TO TINIAN

Marines unload oil drums from a Coast Guard-manned tank lighter and roll them through the surf. Offshore stands an invasion armada of lighters, alligators, LST's, and LCVP's. Jap resistance was soon crushed and Tinian became a B-29 base.

protected by a division and a half of enemy troops. To overcome the defenders, to build the required air and ground installations, to set up and man defenses, and to provide initial supplies, we conclude that 263,000 men and 800,000 tons of cargo must be shipped 6,000 miles.

Can we do it by air? For the cargo alone it would require 80,000 transport planes manned by 960,000 men plus 712 seagoing tankers manned by 39,160 men to provide gas at some intermediate place along the route. Ignore for a moment the fact that we have nothing like a fleet of 80,000 transport planes to do this job. But take note that the total additional manpower needed for air-lifting this cargo is the staggering figure of 999,160. Almost a million men. Whereas 352 surface ships manned by 24,000 men or less could carry the same load.

That's only the cargo problem. How about airlifting those 263,000 men? Existing transport facilities make that about sixteen times out of the question, as will soon be demonstrated in detail. However, I don't wish to

make the problem too difficult. That 263,000 figure is all-embracing. It includes personnel for airfield, road, and construction engineering; for base defense, transport, and service battalions; for medical units, ammunition dumps, and supply depots. Conceivably all these troops will not be needed during the assault phase and before the beach-head has been won.

How about, then, air-lifting the assault divisions? Three divisions, exclusive of a reserve to be committed later, would be a minimum for tackling the defender's division and a half. But before we can talk about air-lifting three divisions we had better see how we are fixed for air-lifting one division.

The new Airborne Division, recently approved by the Department of the Army, has a strength of 16,569 men. Its three airborne infantry regiments are to be trained and equipped on a dual basis so that they can function interchangeably as parachute or gliderborne infantry. The best study of its potentialities and limitations that I have seen appeared recently in *Infantry Journal*

in the form of a two-installment article, "Airborne On Paper Wings," jointly authored by Major Donald T. Kellett and Major William Friedman.

The authors state:

"To airlift *one* new 11,000,000 pound airborne division completely by purely military air facilities, approximately 910 C-82 aircraft or 280 C-82 aircraft, 310 11,000-pound gliders and 242 8,000-pound lift gliders (excluding tow planes) will be required. *This is just about double the number of troop-carrier aircraft now authorized by the Air Forces.*

"The classical conception of the future employment of the airborne division is that of a long flight to a foreign destination, then the dropping of the division and then its accomplishment of a strategic mission. The action includes the air landing of reinforcements, supporting equipment and 'tail,' the evacuation of wounded, and ultimately,

the evacuation of the entire division by air.

"The implications of this concept as to aircraft are tremendous. For the foreseeable future, there is no indication that such a strategic operation would be over friendly territory all the way. Therefore, the operation could not be covered by friendly ground anti-aircraft support, and possibly not by fighter aircraft cover in its final deployment . . . the troop carriers for this hypothetical airborne operation must be more than personnel or cargo carriers. They would require the armament and fire power of Superfortresses.

"Obviously," say the authors, "the United States has no such aircraft at the present time." The conclusions are apparent. Under present conditions the strategic employment of even one airborne division is impossible. It is, in fact, problematical whether *it would be possible to employ even a part of an air-*



Official U. S. Marine Corps Photograph

PARATROOPERS READY TO HIT THE SILK

All that would be required to airlift one airborne division would be the men and arms plus twice the number of troop-carrier aircraft now authorized for the entire Air Force!

sion on a tactical, and not a strategic.

ormation of this new Airborne s, nevertheless, an achievement of e. Lifting it into the air, as the joint out, is within the air transport es of the country at the present would require borrowing aircraft commercial airlines and pooling e available from the Troop Carrier 'ransport Commands. It would be ately benefited by a speedup in n of the 16,000-pound lift glider. employment for distant overseas against strong opposition, is not ssible at the present time for the iven but because it has a non-til"—a heavy weight of tanks, field and heavy equipment which are atachments for sustained combat" ast be brought along later, some-

onsider another argument that is s used by airpower's all-out pro- o cast doubts on the value of com-

bined arms in future warfare. That argument is summed up in the statement that the beach-head of the future will be the captured enemy airfield—that the naval beach-head gained by amphibious assault is a thing of the past.

There is no doubt whatsoever that the use of airborne infantry will continue to have brilliant possibilities until anti-aircraft weapons have made the air unsafe for anything slower than the speed of sound. And there is no doubt that paratroops could seize and hold a hostile airfield protected by a weak force, a force with no hope of reinforcement. Successful prospects for this sort of mission are areas only short distances from the United States.

Against strong opposition, however, or against opposition that can be strongly reinforced, the story is bound to be different. Except for scout and spy jumps of the non-assault variety, no paratroop drops were made by the Allies during the past war that did not call for quick consolidation with ground troops. And it is significant that in



Navy Photograph

IF WE WERE AT WAR TODAY

es, laying a smoke screen over Blue Beach on Vieques during the 1949 Caribbean Maneuvers, illustration of World War II methods and techniques. Current tactics are simply a refinement of past "pushbutton" victories seem a very long way off.

the single instance, at Arnhem, when consolidation could not be quickly effected, the First British Airborne Division was forced to withdraw after severe losses.

I think it is clear to anyone that Island "X"—and its counterparts—can never be seized, held, and maintained from the air. I think it is clear that for many years to come the overseas beach-head won from the air will have to depend on a very close beach-head won from the sea. I think it is clear that though we should leave no stone unturned in exploring the possibilities of new amphibious, air, land, and naval techniques, the keystone of our security and readiness lies within the well-tested frame of combined arms.

What, then, is wrong with our combined arms team? Are we ready to act decisively in the face of all contingencies?

It is my belief that we are not fully prepared to resist and defeat the host of actions within the capabilities of our possible enemies or coalitions of enemies. We have wasted valuable time in a debate about whether air power could save us, or whether it should be naval power, or whether it should be more highly trained infantrymen or paratroops. The debate continues because there is an illusion that we have a choice.

There is no choice. We need them *all*. We need them now—in a state of readiness. And we need them blended into a team that has learned to pull together in the hundred or more exigencies that the nation may have to face tomorrow or the day after. The members of that team must be fully aware that *there is no specially important member, no prima donna, no "George."*

The team concept is especially dear to the Marine Corps. It has lived by it. It has won its victories by it. It has been the Marines' good fortune to spend a good deal more time at sea with the Navy than the Army has. It has been the Marines' good fortune to spend a good deal more time in the field with the Army than the Navy has. Many of the best ideas and equipment for the Fleet Marine Force were drawn from the Navy. Much of its equipment was developed in the Army. The Air Force has helped the Corps in almost all its campaigns. What the Corps has learned from the others is, in fact, one of its most potent secret weapons.

That secret weapon should not be kept secret. The techniques of combined arms belong even more to the future than to the past. Indeed, preoccupation with the team concept in the Marine Corps by no means signifies that the Corps intends to sit tight with the doctrines and weapons that defeated the Japanese. Many improvements in amphibious operations have been made since the war and the Corps has taken a very big part in them.

The landing of troops from submarines (Marines made the first assault landing from the Submarines *Argonaut* and *Nautilus* at Makin Island in August 1942); the development by Consolidated of the "Flying LST," an aerial version of the bow-unloading, ramp-equipped cargo carrier; the use of helicopters for amphibious landings pioneered by the Marine Helicopter Squadron at Quantico, Va.; the perfection of a guided missile for close support of ground troops; the equipping of infantrymen with recoil-less shoulder artillery pieces; the improvement of rocket warfare for both ground and air support; new facilities for the use by Marines of the M-26 tank and new designs for amphibious landing craft including a small, high-speed vessel with overhead cover; experiments with communication, electronic, and anti-aircraft weapons—all these are matters on which the Corps has spent much of its time, money, and manpower in the past year or so.

As a matter of fact, the nation has barely scratched the surface of the list of tactical and strategical uses for the kind of fighting forces we can put together on the Air-Naval-Ground Team principles. A specially-augmented Marine Corps Board has been convened to inquire into and determine the practical possibilities of many new concepts along these lines. Small, heavily-defended island areas like Tarawa and Iwo Jima possibly need never figure in any projected operations in Eurasia, to cite one instance. Eurasia's coastline is eight times that of the United States. It is proportionately more vulnerable to surprise attacks from the sea in hundreds of places, including its large peripheral islands.

Possibly the clashings of massed armies need never again be the style of warfare by which a well-prepared invader gains decisive victories in Europe, Asia, or anywhere. The

very enormity of some of the areas to be defended will diminish the defenders' advantages in superiority of manpower. Employing a trained fencer's thrust-and-parry technique, or the nimble maneuvering of an adroit matador, it is possible that the American Air-Naval-Ground Team can learn to reach the defenders' cities, industries and heartlands in a manner that would make the last war seem clumsily orthodox.

These are possibilities that are not being ignored by the Navy and Marine Corps. There is just this difference between us and disciples of the Pushbutton and Let-George-Do-It Schools. In more than 300 landings since 1776, the Navy and Marine Corps, by virtue of their state of readiness, have been in George's shoes from the very start, fight-

ing a sort of war the sages had decried in advance as wholly obsolete. We have become wary of overly joyful announcements of glorious substitutes for the whole team.

At a time when there is a new hope for peace in the family of nations, it is important to remember with utter realism the lessons learned in wars past—and how to improve those lessons. The American fighting man has won all our wars. He has won them on an American Team, and with arms and weapons made by American industry. There is no reason to believe that future wars will be prevented or won by any other kind of combination. That combination is the one and only George who has resisted tyranny from the birth of our nation to VE Day and VJ Day.



THE NAVY AND "POLLY"

Contributed by MISS PEARL PUCKETT

Few civilians ever heard of "Polly." Once you've met her, you'll never forget her, as the "voice" is simply out of this world. Months later you'll still be pinching yourself to see if you were dreaming.

"Polly" joined up with the Navy's PB4Y-2 aircraft (Navy version of the B-24 Liberator) and played an unparalleled role in the Pacific. For instance, millions of Japanese have been scared "spitless" by a loud booming voice that seemed to come from the Heavens and spread all around them—a mysterious voice without a body that a superstitious Jap, or an average American civilian for all that, would find difficult to savvy.

Technically, "Polly" is a loudspeaker system, having a million times the intensity of the ordinary voice. This 2000-watt sound system was mounted behind movable panels in the side of the Navy PB4Y-2 aircraft and swiveled so that the operators could cover the desired target area. Even while the plane circled 10,000 feet up, "Polly's" voice boomed down upon the frightened spectators below; a voice from the clouds that simply seemed to fill all space.

The "Polly" system has two speakers, each consisting of 36 speaker units. They create a sound-intensity level in excess of 130 decibels at a point 30 feet in front of the loudspeaker, which is somewhat over a million times the intensity of a human voice coming from your ordinary radio's loudspeaker.

"Polly" can use either recorded material or speech direct from a microphone. The microphone is a close-talking affair which you almost have to eat in order to make operate. The records "Polly" uses are made on magnetized wire.

"Polly" is the brain child of the Stevens Institute of Technology, General Electric Co., and the National Defense Research Committee. "Polly" did her greatest work for the U. S. Navy in the Pacific area in persuading Japanese troops on by-passed islands to surrender. She did a beautiful job of "mopping-up" without bloodshed or fighting. One of her unparalleled feats was locating missing aircraft and fliers who were downed in the jungles. In this instance she literally stretched seconds into hours and days by mobilizing the friendly natives on various islands to search for the missing fliers, and often directing the fliers to safety.

"Polly" was the one to announce to by-passed Japanese units that the war was over and the one who gave specific instructions for the enemy surrender. Enemy military personnel were told to report to a specific beach, where Naval craft would meet them.

The Navy's famous "Polly" has unlimited possibilities in Post-War America—for instance in directing posses, in forest fires, and in grave emergencies. If you have the rare privilege of listening to "Polly," give her a hand, for it's the voice of the U. S. Navy.

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS).



Official U. S. Navy Photograph

YD-171, "THE SEAGOING SAMSON"

Surrendered by the Germans, this monster floating crane stands 374 feet high and can lift the equivalent of 283 automobiles at the same time.

THE NAVY'S COLOSSAL CRANE

By WARREN HUGHES

ONE of the Navy's strangest craft, unromantically titled *YD 171*, might be called by the more meaningful and appealing name of "Seagoing Samson," for it can toss freight-train weights about like a skilled juggler. The *YD 171*, reassembled at Long Beach Naval Shipyard, is one of the largest floating cranes in the world. Twice as tall as the Leaning Tower of Pisa, the crane stands 374 feet high with its boom raised.

The crane, one of four built in Germany during the war, was awarded to the United States under the authority of the Tri-Partite Naval Commission. One of the original four was sunk. Another, scheduled for award to Russia, was not complete when the war ended. The remaining two, used at Kiel by the Germans for submarine construction and repair, were taken over by the British. It is one of these bulging biceps of the briny deep that was assigned to the Navy.

By flexing its muscles recently in a 10 per cent overload test, Samson reached 59 feet over its side and heaved nearly 425 net tons (2000 pounds each) into the air to prove its strength. That 848,900 pound test, equivalent to lifting 283 automobiles in the air at one time, was as large as any ever accomplished by a water-borne crane.

Self propelled, the crane can slither through the water forward, backward, or sideways. It has no rudder, yet can turn in its own 205-foot length. It can make a complete circle in 54 seconds. As handy as if it were hinged in the middle of its 109 foot beam, the *YD* is maneuverable by virtue of its three Voith-Schneider propellers—two at its stern and one at its bow. The propellers, unlike conventional screws, rotate on a wheel whose axis is perpendicular to the keel. Six tapered bronze blades that look like six-foot Irish shillelaghs are attached to the rotating wheel to flail the water for propulsion. The blades thrust in the direction

desired and feather until in position once more. By variable pitch of the blades, controlled from a pilothouse in the derrick structure, the diesel-electric craft can maneuver itself into narrow berths without the assistance of a tug.

Resting on a mammoth compartmented pontoon, the weight lifter is of the type known in marine engineering as a double-jib derricking crane. It consists essentially of two parts. The fixed part, shaped like a pyramid, transfers all operational forces from the derrick to the pontoon. The rotary part, shaped like a bell, fits over the pyramidal support structure. The hoisting system is connected to the upper part of the bell and the device is balanced by counterweights. Four hundred tons of stationary weight is built-in; another 200 ton weight operates on a pendulum to accomplish level luffing—maintaining the block of the boom in a horizontal path as it moves radially.

For heaviest loads, two 175 metric ton (2,204 pounds each) capacity hooks may be linked together to lift 350 ton loads from 26 feet below the waterline to 170 feet in the air. For relatively light loads like a carload of armor plate, two 30-ton hooks and one 10-ton hook serve as auxiliaries. The auxiliary hooks move in and out on the boom by trolleys.

Up to a height of 102 feet above water, no portion of the crane extends beyond the pontoon fender so that collisions with other vessels moored alongside cannot occur.

The crane operator works in a "clear vi-

WARREN R. HUGHES was graduated in 1938 from the University of Texas. Commissioned in the Naval Reserve in 1942, he served on the staff of Commander Service Force Pacific and in the U.S.S. *Pawnee* in the South Pacific Force. Later he commanded U.S.S. *Quapaw* and *ATR-55*. He has written short articles for *Saturday Evening Post*, *Popular Science*, and *Our Navy*.

sion" booth high in the rotating structure. Transparent dials on his switchboard light up like a pinball machine to indicate the condition of hoists in operation, leaving the operator freedom to concentrate on crane operations without having to rely upon memorized data. "When we made the overload test, I could feel the crane heel over like a pole vaulter clearing his mark," the operator says. "The operator's cabin jutted out over the side of the pontoon and I could see waves lapping up at me 90 feet below. It was all right, though," he concludes, "we still had two and a half feet of freeboard left on the pontoon. Less freeboard would have been too little, the design people tell me." The supporting pontoon has a depth of seventeen feet; it has no trimming tanks; and maximum safe inclinations have been set up for various weights at different positions on the boom. The equipment has safety features built in, but none takes the place of alert operating personnel.

Hoists can be slowed to speeds not perceptible to the human eye for working in narrow spaces. On the other hand, the crane can operate with the speed of a bounding gazelle to toss, say, a thirty-ton turret into the air and lower it away at 56 feet per minute, or to kick a mere five-ton anchor about at 168 feet per minute.

Hoisting gear is operated by a 440-volt DC motor whose power is supplied by converters connected to the main AC generators. The main cable, one and seven-eighths inch galvanized cast steel 8×36 wire with a hemp core, is ten times reeved on two blocks at hoists. Inside the derrick structure, the cable drums, ten feet in diameter and thirteen feet long, receive the wire in grooves in one layer. Cable drums may be synchronized with a coupling device when both of the largest hooks are to be used together for extremely heavy lifts.

Though the crane, valued at three million dollars, is worth more than thirteen times as much as the Navy spent to put it into shape, the giant gave the Navy plenty of headaches before it was ready for operation.

It was towed by Navy tugs from Bremerhaven to the Pacific Coast. All of the superstructure above the butt boom—the lower part of the derrick—had to be removed to

keep the boom from collapsing in passage. Even stripped of its upper works, the crane was over 130 feet high. Built-in fenders of the pontoon had to be removed to allow it to pass through the Panama Canal.

When the stripped-down crane arrived in Long Beach, workmen set about repairing minor bomb damage to the hull and upper works. Public Works engineers turned to checking the design, converting metric measurements, and translating foreign terms. Much engineering data considered vital by the Navy was omitted from captured German prints. American engineers, calculating stresses and strains, made new plans and operating instructions, and figured new safety factors.

The superstructure arrived separately and had to be assembled on the butt boom. The Navy's then largest crane ship, *AB 1*, was assigned the job of lifting the heavy, high tensile steel parts into place. With a 250-ton capacity boom, the crane ship was powerful enough to lift the parts; but with the German crane in the water alongside her, *AB 1* could not lift high enough to reach the tree-top tall boom of *YD 171*. Neither sky hooks nor a cloud hoist were available. The Navy was up in the air; the crane's jib-booms and telescope coupling, unfortunately, were not.

Finally one of the engineers on the project had a bright idea: if *AB 1* could not be made higher, then make the German crane lower. The Moreell drydock, he said, is like an enormous bathtub. Place the German crane in the tub, pump it dry, and the crane would drop almost fifty feet below sea level to the drydock floor. The crane ship, he pointed out, remaining at sea level outside the caisson of the graving dock would then reach high enough for the job.

Swell idea, everyone agreed. The German plan for docking, however, was not complete. Positions of various underwater openings of the 5000-ton displacement pontoon were not accurately located. A new docking plan had to be devised by Public Works. Plans for ballasting the forward part of the pontoon had to be made to insure even docking, then for removing the ballast to prevent hogging as it settled to rest on keel blocks. To complicate matters, nature added

Yard's difficulties by providing a high Only after the ballast was removed, ck pumped dry, and the hull inspected ficial anxiety subside. The giant had cked perfectly. Rear Admiral Thomas oop, Shipyard Commander, and Cap-I. W. Baumer, Public Works Officer, l at the mammoth crane as if to say, k you, Samson, for behaving this

AB 1, the crane ship which was once the *Kearsarge*, pride of the battle fleet d the turn of the century, moored ide the dock. Its boom was then high h for the operation.

aturalized crane was stationary on locks in the graving dock. The floating however, was water borne, subject to nd pitch with the waves. Travelling s, operating along the edge of the dock ist in the reconstruction, were stable. *AB 1* heeled over slightly and surged he waves as it lifted the first 350,000- l piece of the German boom into place. ection had to be attached to the k with two heavy pins. The steel pins, en inches in diameter, each weighed than ten heavy men, and fit with y-one thousands of an inch clearance. ermore, both pins had to be set at the instant to prevent twisting the boom. : traffic was stopped.

was something like a nervous giant's g one foot on land and the other in a as he placed a new 175-ton balance n his watch," O. A. Faircloth, Master r supervising the job, says. "The was steady, but the giant and balance oved with every surge."

ggers judged a three-inch surge of the ship, timed their action carefully, and ured the pins home with hydraulic

The first operation required fifty-two es after the member was lifted into the 'It was a matter of outguessing the ," Faircloth says. "We expected to take for that part of the job alone."

the job progressed, erecting structural ers became more difficult. To place b-booms, auxiliary hooks of the crane had to be overloaded by eight tons. rs, perched 200 feet in the air with hands and heads hanging down, had no

place to go as the jib-booms swung into position to be pinned with eight-inch pins. An afternoon Long Beach wind sprang up, not so violent, perhaps, as the one which interfered with drydocking, but nonetheless nerve wracking. The crane ship danced a hornpipe, surged back and forth, and riggers fought the wind, tide, and surge. "Riggers clung to the booms by their imaginations for three and a half hours before we succeeded in pinning the jib-booms," Faircloth says.

As the hoisting structure of the *YD* went into the air, the rig had to be shortened by removing temporary erection links. All this was headache enough, but when the boom was raised to 14°, the crane's counterbalance mechanism had to be attached as the second lift. The counterbalance mechanism weighed 47 tons, and an error at this point could have meant curtains for Samson; also, 200 tons of concrete weights were added progressively in units of 10 and 15 tons. The crew of an LSM drydocked with the crane was ordered ashore for safety. Riggers felt their way along with feeler gauges, once more out-guessed nature, and jacked the pins into place. They then removed the remaining erection links, brought the boom under its own power and hooked the levelling link into place.

The remaining work, straight rigging of cables to blocks, hooks, and drums, was no simple matter, but not so difficult as that summarized above. "Never did a job I was more proud of than this one. And to do it I had some of the best riggers in the world, all trained in the fact that safety comes first and showmanship plays no part in the rigging game," Faircloth says. "When it was over I took a deep breath and went fishing." Not a man was hurt on the job.

The crane is now being tested with different weights and varying conditions under the supervision of F. A. Williams, formerly of Bremerton, Washington. An electrical engineer connected with the Long Beach Yard, Williams jots figures in his notebook with every lift and swing to plot charts on the crane's operational characteristics.

Before long, Williams says, its tests completed, the floating crane will be heaving away on construction and repair jobs on the Navy's largest ships.



Official U. S. Coast Guard Photograph

THE MAIN REASON FOR CLOTHING IS TO PROTECT THE BODY

This lookout in the north Atlantic is wearing foul weather garb to protect him against snow, ice, and zero temperatures.

THE UNIFORM PROBLEM

By LIEUTENANT J. C. BUSBY (S.C.), *U. S. Navy*

MAIN SEKER carefully buckled on his undress sword belt, smoothed out the wrinkles in his white cotton uniform, and briskly stalked out of his cabin to the crew at quarters. The Captain of the ship, and, after a couple of years' command, every man in the crew had that meticulous compliance with regulations was the best way to keep out of the personnel inspection. As he passed down the opened ranks with his Executive Officer, the Captain was well with what he saw: the whites were the ranks faultless.

When he was alone in his cabin with his Executive Officer, the Captain began to talk. "You know," he said, "all in all I think the Navy has done a good job on our uniforms. These whites get dirty easily, but they at least do look good. And those blue uniforms are perfect for giving us a smart appearance together with long service stripes. But sometimes I do wish things weren't quite so hot." The Executive Officer replied, "what we need is something that is cool and gives a military appearance."

The conversation has a familiar ring. It has happened on a bright summer day in the twentieth dynasty of the Empire of Egypt as one of Rameses III's boats rode at anchor in a Mediterranean harbor. And it might just as well have happened aboard a cruiser in August, 1918, in the sweltering heat of the Norfolk Naval Shipyard.

The moral is patent: our naval uniforms are no more comfortable, no more durable, and probably no more in style than those of the ancient Egyptians. As a matter of fact, the loin cloth and the sandals of the ancients were probably much more comfortable than the jumper and black oxer of the present Navy.

For the last three thousand years, men have progressed from smoke signals, runners,

and telegraph drums to radio, television, and even NTX. We have progressed from cart and horseback to the automobile and airplane. Ships manned by galley slaves (doubtlessly precursors of present-day junior officers) are now driven by steam and electricity. And in all this time our naval uniforms have gone from heavy, hot white drills to heavier and hotter white drills; from blue serges and gabardines to blue serges and gabardines. As a matter of fact, when contrasted with transportation, construction, communication, or almost any of the other large fields of human endeavor, the art of clothing ourselves appears at first glance to be somewhat unprogressive.

It would be trivial at this point to enquire why we have not progressed very far in the textile and clothing industries. It would be quite constructive, however, to examine what we can do about it.

Let us first reduce our intuitive (and possibly nebulous) concepts of satisfactory uniforms into slightly more objective standards by which we can judge "progress." In logical symbolism, satisfactory uniforms may be defined by:

$$Us = f(P, D, A, M)$$

This equation means that *Us* (satisfactory uniforms) is a complex function of the variables: *P*—protection (or comfort); *D*—durability; *A*—appearance; *M*—miscellaneous factors including cost, availability, cleanliness, ease of stowage, etc.

There appears to be no immediate reason

A GRADUATE of the University of North Carolina, Lieutenant Busby was commissioned directly into the Navy in 1942. He has served as Supply Officer of the U.S.S. *Gallatin* (APA-169) and in various supply billets at the Navy Pre-Flight School, Chapel Hill, N. C., the Norfolk Navy Yard, and the Naval Clothing Depot. He holds the degree of Master of Science in Textile Engineering from the Lowell Textile Institute.

why the relationship given above could not be further analyzed to establish the exact function, nor any reason why the four variables could not be measured and expressed in one dimension. Such examination would be tedious in this non-technical paper, however; and it is preferred merely to establish that:

$$P_n > D_n > A_n > M_n$$

or that: when expressed in similar (abstract) units, and assuming each variable to lie near the center of its domain or range, then uniforms should be judged first from the standpoint of protection (or comfort), then from that of durability, then from that of appearance, and finally from that of such miscellaneous factors as cost, availability, and so forth.

Perhaps this argument may be made clearer by a definition of the variables.

Take "protection" for instance. The human body is basically a stove that is continuously burning carbon compounds and producing heat that must be dissipated, otherwise the body will get too hot and die. The amount of heat that must be dissipated varies from 60 to 750 calories per hour depending on the metabolic rate and characteristics of the individual. On the other hand, this heat must not be dissipated substantially faster than it is generated, otherwise the body will get too cold and die also.

So the primary object of clothing—in order to keep the body alive—is protection: to establish a degree of insulation¹ that will permit just the right amount of heat, and no more, to be dissipated. Can this insulation be measured? Absolutely. If we assume an average person and a given level of activity (or metabolic rate), we can calculate very closely how much heat the body must give off. By knowing the temperature and other conditions of his environment it is a relatively simple matter to compute the required *clo*² value of his uniform assembly. And the *clo* value of uniform assemblies can be calculated mathematically, or it may be obtained

from a quick empirical measurement by use of the copper man. This is a device used at the Harvard Fatigue Laboratory and the Climatic Research Laboratory (of the Army) that is about the size and shape of an average man. Electrically heated elements are arranged through the skin structure, and the entire assembly is placed in a controlled temperature room. By measuring the electrical energy needed to keep the copper man at a given temperature, the insulation values of various clothing assemblies on it can be estimated.

It should be pointed out that our laboratory methods and mathematical calculations are far from exact at this time. When the body gets too hot, substantial evaporative cooling from perspiration occurs, and so far no fully satisfactory method for bringing this variable into the equations seems to have appeared. The problem is further complicated by the fact that we assume that heat is lost mostly (a) through warming and humidifying inspired air, (b) by evaporative cooling, (c) by convection loss to the atmosphere, and (d) by so-called "normal" radiation and conduction loss. Under certain circumstances (for example, standing knee deep in water on a submarine bridge) our empirical equations are practically worthless. Furthermore, metabolic rates do not always hover around a given level. A signalman may work himself into a frenzy of perspiration one hour and sit perfectly still drinking coffee for the next two. A given *clo* value of a clothing assembly does not even assure comfort to every individual. Some gangly men with extremities far from the heart need extra body insulation to keep from getting cold. And after all, we begin to complain about the cold when the feet become chilly, not when the *entire body* becomes chilly.

Finally the psychological element plays a large role. In Alaska (where the GI's wear Eskimo clothing and the Eskimos wear GI clothing), Dr. Molnar of the Fort Knox Armored Medical Research Laboratory ran an interesting experiment several years ago. He selected a group of Eskimos and another group of soldiers, clothed them all in standard Army winter clothing, and left them out in the Alaskan cold. In a short while the

¹ In practice, the insulation of any given clothing assembly may be varied enormously by unbuttoning a jacket, removing the hat, or loosening a drawstring.

² A unit of clothing insulation.



Navy Photograph

HOW MUCH LAUNDERING WILL A UNIFORM STAND?

Durability against wear and tear must be an important consideration in any uniform adopted for the Armed Services.

omplained that the cold was uncomfortable. Could it be that the Eskimos somehow physiologically acclimated themselves to the cold? The doctor and body temperatures of all the Eskimos were amazingly enough, the temperatures of both soldiers and Eskimos were the same. The prevailing psychological attitude as a valid explanation.

ing the above deficiencies does not invalidate the techniques. We get every day, knowing full well the variables—wind pressures, sweating, crystallization of metals—precisely calculated. By using instruments and other devices, structural engineering has been able to advance to the

point where it is popularly viewed as an exact science rather than an art; and it is respectfully submitted that the same may be done eventually for clothing.

No consideration will be given in this paper to special types of clothing for radiological defense, gas warfare, or similar uses. The concept of "protection" as a primary feature of satisfactory uniforms applies equally well to all special purpose clothing; and it is to be noted that the body must be given protection not only from cold and wind, but also from thermal neutrons, chemical agents, or whatever else is under consideration.

Next, consider the variable "durability." By this we mean (a) "How long can it be worn before it must be washed or cleaned?,"

and (b) "How long can it be worn before it must be discarded?" From the standpoint of short term durability, cotton khaki is inferior to tropical worsted, which in turn is inferior to worsted gabardine. We have never measured exactly the long term durability of cotton khaki versus worsted, but it is probable that they are very close to the same. There is no really satisfactory khaki dye for cottons, and even though the original fabric is very strong, its degradation in sunlight and laundering is very high—so much so that probably every naval officer has experienced a ripped cotton khaki garment because the fabric had become "rotten" with age. In summary, fast dyes, dimensional stability in laundering and cleaning, satisfactory abrasion resistance, and wrinkle resistance all contribute to the concept of "durability." Naval uniforms must possess this characteristic, and it is second only to protection in importance.

"Appearance" is a variable that may have been over-emphasized in our present uniforms. Appearance basically concerns that which satisfies us aesthetically. It is interesting to note that perhaps the uniforms mold our taste rather than our taste molding the uniforms. A survey made during the war by the Bureau of Naval Personnel indicated that a substantial number of men were dissatisfied with their "monkey suits." And yet a very precise survey conducted by the author in the fall of 1947 indicated that more than 83 per cent of the men were quite satisfied with the uniforms. Taste undoubtedly changes. Ten years ago practically no one went tieless in civilian clothes, and yet the advent of the California type sport shirt has made the appearance of the tieless civilian quite commonplace. One thing that is plaguing clothing development at this time is the question of luster or shine in clothes. Until a few years ago a man wouldn't be caught dead in a suit or coat that looked like a shiny rayon or silk. Yet today luster gabardines are more in demand on the New York market than almost any other type of men's suiting. The Naval Clothing Depot has developed and transmitted to the Uniform Board several light weight summer raincoats, all of which look like something out of Buck Rogers because of the luster of

the nylon, fortisan, and other fibers used. The author ventures to predict that, if these coats are adopted, they will eventually be widely accepted by naval officers (after the usual preliminary snorts of disapproval, however); and that 25 years from now, any effort to "sell" a dull black coat to the Navy will be doomed to failure. Actually, clinging to our British style of coat-trouser-shirt uniform combination for the reason of "appearance" may not be justified. Changing to a radically new type of uniform (say an Army shirt-trouser type) may well mold our aesthetic taste into new channels so that we would view our present uniforms as as much out of style and appearance as the iron spiked helmets and the long coats of the nineteenth century naval officer's uniforms.

The final consideration of the concept "satisfactory uniforms" concerns such miscellaneous factors as availability, cost, etc. For example we could make a topcoat out of vicuna that would be as warm as a bridgecoat and as light as a summer weight civilian raincoat. But there aren't enough vicunas available in South America to supply material for an initial issue of garments, much less replacement stocks. We could make up some superbly custom tailored shirts out of lightweight worsted fabrics treated for shrink resistance to make them launderable. And yet the cost would be prohibitive for issue to enlisted men and well above what the average officer could afford to pay. Many other miscellaneous factors come under this final variable—allergy reactions, launderability, stowability, to mention a few—and yet by and large they are the final items to be considered in determining whether uniforms are satisfactory.

To conclude: it is proposed to establish an objective standard for measuring naval uniforms, such standard to be a function of the following variables in order of their normal importance: Protection (or comfort); Durability; Appearance; Miscellaneous.

Having established a measuring stick as a first step in improving our clothing over that of the ancient Egyptians, a reasonable basis upon which to begin improvements might be somewhat as follows.

Since our primary aim is protection

st the environment, why not first find what the environment is and compile information in useful form?

Micro-climatic data is already available in the form of records of various weather stations all over the world. This data might well be collected, analyzed, and issued in the form of "clothing maps"—say, a new map for each week or month of the year. For example, a classification of the environment might be: Hot-humid—(red); Hot-dry—(orange); Temperate—(green); Cool-dry—(yellow); Cool-wet—(brown); Cold-dry—(light blue); Cold-wet—(dark blue); Ultra-cold—(white).

For each area of the world where naval personnel are likely to go would be appropriately classified to indicate the micro-climatic environment during that particular month or

even the above classification, research personnel will have a definite target for their designing clothing to protect against a specified list of environmental levels.

The next step is to design the clothing. At this point it might be well to state that the lack of previous basic research in the textile industry presents an appalling handicap. One knows, for example, how strong a flannel fabric should be. Our specifications for blue flannel shirts require a tensile strength of 35×35 pounds; for cotton twill, 170×100 pounds. These figures are based on what we need, but are rather far from what we have obtained in the past.

Assuming the research group comes up with a determination that a shirting fabric, say, a brown environment must have a cubic foot air permeability, 45×50 lbs tensile strength, 5 ounce weight, and so on down the line, we have absolutely no way at present to make such a fabric except by trial and error. Today, after thousands of years of making fabrics, it is generally impossible for us to predict all the physical properties of a new fabric without actually making it and running tests on the finished product. This hit or miss method is enormously wasteful: picture the situation if similar techniques were used in building bridges, for example.

Under the situation as stated, basic re-

search must be undertaken (1) to determine what the physical characteristics of fabrics must be to meet various end-use requirements; (2) to establish an engineering handbook so that fabric designers may predict accurately the physical characteristics of fabrics, knowing what raw materials and manufacturing methods are used.

This basic research, lengthy though necessary, will culminate in our ability to design fabrics to fit our needs. The design of clothing using these fabrics will follow the same pattern of development: determination of what physical characteristics are necessary, and establishment of an engineering design approach to meet the characteristics.

Properly prosecuted, the above program might eventually result in something like this:

Each man would be issued, say, a dozen different types of garments together with a table showing how to assemble these garments into, say, eight basic uniform assemblies. To determine which assembly he should wear, the man would consult his clothing map which would show the correct assembly for his type of shipboard duty in whatever location the ship might be. The man could then don his assembly confident of its propriety under the circumstances.

The days of wearing blues on sweltering summer days because of local orders would be gone; the days of wearing a pea coat to keep the chest warm while the legs froze would be gone; and in short the present day uniforms would be relegated to the realm of nostalgic memories where now abide the clipper ship, hard tack and horse meat, and official correspondence written in longhand.

Let not the course of action outlined above be taken as easy, or even as completely feasible. Much work must be done to establish tolerance levels for individuals; the inherent variability of fibrous materials may make an exact engineering approach to fabric design impossible; we may in fact never be able to establish basic clothing assemblies because of differences in individuals and in shipboard duties. Nevertheless, it is at least an approach, and after some thousands of years it would seem high time for an approach to the problem of providing better clothing.



International Newsreel Photograph

RIDDLED BY INSURRECTO BULLETS AND SHELLS

This house in the suburbs of Manila was a target in the early fighting. It was to Japan that Aguinaldo and his insurrectos turned for smuggled arms and ammunition.

JAPANESE IMPERIALISM AND THE AGUINALDO INSURRECTION

By JAMES K. EYRE, JR.

HISTORY indicates, Japan's desire to acquire a far-flung empire, including the Philippines, went back to at least the nineteenth century. One of the most interesting chapters of the story of Japanese imperialism during the modern era involved connections with the Spanish-American War of 1898 and the resurgence of the Filipino insurrection against the United States the following year. A careful examination of these events should throw much light upon the manner in which Japan strove to achieve her overseas ambitions.¹

When the United States declared war on Spain in April, 1898, relations between Tokyo and Washington Governments were on a very cordial basis. This condition reflected by the active American support of Japan's successful efforts to revise unequal treaties with the Western powers in the closing years of the nineteenth century. In so far as the Spanish-American War was concerned, the position of Japan was technically that of a neutral. Throughout the conflict, however, the Tokyo Government pursued a diplomatic policy indicating endorsement of American objectives. In turn, seemed to be supported by Japanese public.

Hostilities between Spain and the United States ceased on August 12, and a peace conference was to be held shortly thereafter in Paris. The Foreign Office at Tokyo declared that the United States should be informed of Japan's official views concerning the position of the Philippines. Conversa-

tions followed between the diplomatic representatives of the two countries. The Japanese emphasized that the Filipinos were not capable of governing themselves. At the same time, they maintained that Spain had been eliminated as a factor in determining the future of the Philippines. In view of these considerations, Japan was convinced that the United States, rather than some European power, should retain the long archipelago in its entirety. If necessary, the Japanese were willing to share with the Americans the responsibility of governing the Filipino people.

This diplomatic activity on the part of Japan was a factor in the determination of policy by the United States. Being interested in the issues of the Spanish-American War, the Far Eastern nation served as a listening post for information pertaining to the attitudes of the major powers concerning the Philippines. Without question the Japanese were opposed to any step whereby an unfriendly European power would have acquired a foothold in the Islands. This reaction, although not decisive, tended to substantiate and to strengthen certain points of view which already had developed at Washington. One of these, of course, was that if the United States abandoned the Philippines, the rivalries of the other powers would result in a serious situation, possibly to the extent of creating an international war of far-reaching proportions.

Despite the fact that the official policy

material for this article and the previous one, "Japanese Imperialism and the Philippines," resulted from a world-wide search for information which covered a period of years. Correspondence with individuals in Germany, Japan, England and the Philippines was conducted. Extensive use was made of Departmental files and U. S. Navy records in the Archives, as well as several volumes of documents published by the Philippine Government.

LONG A student of naval and maritime affairs, especially in connection with the Pacific and the Japanese, Mr. Eyre served for some time as Special Assistant to President Sergio Osmena of the Philippine Republic. Mr. Eyre is the author of numerous previous articles in the PROCEEDINGS, many of them dealing with the Asiatic seaboard.

of the Toyko Government, supported by a large segment of Japanese public opinion, endorsed the decision of the United States to retain the Philippines, it was by no means the only reaction voiced in Japan regarding the disposition of the former Spanish colony. Prior to 1898, there was much evidence to indicate that the Japanese themselves had desired to supplant Spain in the Philippines. Whatever hopes had been entertained for an early achievement of this goal gave way, however, to the realities of Japan's international position at the time of the Spanish-American War. Hard-pressed for assistance on other fronts, the former hermit kingdom had little choice but to sanction American retention of the Philippines. Even so, there was a strong undercurrent in Japan, particularly among the expansionist-minded groups, to the effect that the United States should not be permitted to fall heir to the Far Eastern colony. This minority point of view carried with it an ominous warning regarding the future.

While Spain and the United States were still at war, the press of continental Europe occasionally suggested that Japanese and American interests conflicted over the solution of the Philippine problem. It was also rumored that Czarist Russia was utilizing the rich archipelago as bait to draw the ambitious Asiatics away from their endeavors in China. This prompted the British Minister to Japan, Sir Ernest Satow, to make inquiries at the Tokyo Foreign Office. He was informed that the Japanese were not interested in acquiring the Spanish possession because they had their hands full with Formosa, which was causing much trouble.

The Japanese press itself, though generally favorable to the United States, contained scattered protests against American occupation of the Philippines. According to one leading journal, which had manifested opposition to American policy on more than one occasion, "It is assured that America will take the Philippines, and with Hawaii and the Philippines, she will hold the key to the Pacific, and the balance of power will be completely upset. Japan bears no ill-will towards America, but she should prevent the Philippines from falling into the hands of this great nation."

On February 4, 1899, less than two months after the Treaty of Paris was concluded, fighting broke out in the Philippines between Aguinaldo's followers and the American expeditionary force. As before, the official policy of the Japanese Government and the dominant public sentiment in Japan appeared to stand squarely behind the United States with respect to this additional phase of the Philippine problem. The majority of the Japanese newspapers expressed the opinion that the broader aspects of their country's relations with the United States compelled this attitude.

The Filipino insurrectionists, however, were not without their public champions in Japan. Through the medium of the press, some statements were made in open support of Aguinaldo's cause. Unknown to most observers, this criticism of American policy, which was embraced by a minority, assumed a greater significance in view of the negotiations which were transpiring secretly between the Filipino dissidents and influential Japanese. Repeating the precedent established during the earlier revolt against Spain, the embattled natives had turned to Japan for aid. In conformity with a general plan to gain international recognition for his movement, Aguinaldo had sent a trusted lieutenant, Mariano Ponce, to Tokyo in June, 1898.

One of Ponce's major objectives in his negotiations with the Japanese was the acquisition of arms and ammunition which were badly needed by his rebellious compatriots. For this purpose the Filipino Revolutionary Government had nearly half a million dollars at its disposal. A large part of this sum had been given Aguinaldo by the Spaniards under the terms of the peace agreement which terminated the revolt of 1896-1897. The rest came from a number of sources available to the leaders of the insurrection. Ponce tried continuously to make arrangements with the Japanese Government for the purchase of the desired military supplies, but success in this connection persisted in eluding him.

Meanwhile, the activities of Ponce and his associates had not gone unnoticed by United States authorities. Major-General Otis, Commander-in-Chief of the American

s in the Philippines, reported to Washington on September 12, 1898, that it was understood the "insurgents had contracted the Japanese Government for a considerable supply of arms and ammunition." On September 13 of the same year, he spoke of information received which "asserted that the Japanese Government has promised protection (to the Filipinos), favored by some, as a kindred race."

One result of the reports forwarded from Manila to the War Department at Washington, key officials in the United States Army and Navy, as well as the Foreign Service, were alerted to guard against the possibility that the Filipino insurgents might get large-scale military aid from Japanese sources. The naval attaché of the United States Legation at Tokyo was particularly active in observing the activities of Ponce and his co-plotters. His findings resulted in a number of highly confidential dispatches to Washington. Admiral George Meyer was similarly active in taking precautionary measures, and all vessels under command were instructed to make certain that incoming commercial ships were not smuggling arms from Japan to the insurgents.

Ponce, in the meantime, had met another individual who rendered him valuable assistance. This individual was none other than

Yat-sen, the father of the Chinese Revolution. At this particular juncture in Eastern history, Japan had become the refuge of revolutionaries from not only the Philippines but other countries of Asia as well, including China, Korea and India.

These men often conferred with one another regarding their aspirations for the future.

Sun Yat-sen was unquestionably the outstanding member of the entire group. Already plotting the overthrow of the Manchu Dynasty, Sun had gone to Japan where he was afforded political asylum. The Chinese underground leader became very interested in Aguinaldo's campaign for Filipino independence because he regarded it as a development, similar to his own program for a republican China, which would contribute to the progress of East Asiatic peoples. With this thought in mind, he made no effort to espouse Aguinaldo's

cause in Japan and he became the warm friend of Ponce.

It was undoubtedly Sun Yat-sen who opened the door to Ponce in another direction—the Japanese secret societies which were paving the way for their country's unfolding program of imperialism. The most prominent of these clandestine organizations were the Black Ocean and Black Dragon Societies. Their influence became so great that their policies were eventually adopted by the Japanese Government. Once Ponce became *persona grata* to the Black Dragon and Black Ocean Societies, no door in the political and military life of Japan was closed to him. The imperialistic groups had contacts everywhere and many outstanding Japanese officials were in constant touch with them. By means of his reports to his revolutionary associates in Hongkong and the Philippines, Ponce indicated that he was in frequent association with the clandestine organizations.

Despite the continued friendliness of the Japanese Government, there were some signs that the United States had grown wary of Japan's intentions towards the Philippines. The First Philippine Commission, appointed by President William McKinley for the purpose of establishing civil government in America's new colony, sailed for the Far East in January, 1899, and stopped in Japan en route to Manila. Marquis Hirobumi Ito, formerly the Japanese Prime Minister, offered to aid the Commission in restoring peace in the Philippines. He contended that existing conditions of open warfare between Filipinos and Americans resulted from misunderstandings. He pointed out that the Americans did not understand Asiatics, and since he was an Asiatic himself, that he was capable of straightening out the difficulties. His offer, potentially important as it was, met a polite but firm refusal by the State Department at Washington.

So carefully hidden were the undercover activities of the Japanese helping Ponce, however, that the United States Government was able to secure but a partial picture of events which were taking place. On the basis of intelligence reports received from Tokyo and Manila, Secretary of State John Hay had instructed the American Minister to Japan

to investigate the possibility that Aguinaldo's representatives had succeeded in purchasing munitions from the Japanese. The American diplomat went to the highest official levels and was told that the Japanese Government would not sanction such a violation of her neutrality.

The Filipino efforts to obtain arms and ammunition in Japan and elsewhere comprise one of the most interesting as well as one of the most secret chapters of modern Far Eastern history. Of foremost significance in the entire sequence of events was the fact that Ponce finally succeeded in purchasing a large quantity of military supplies which were shipped from Japan to the Philippines. After encountering failure in his previous attempts, the Filipino emissary managed to procure ten thousand Murata rifles and other articles of war. The Muratas were considered by Ponce to be ideal weapons for Aguinaldo's forces. They had been manufactured to conform with the size of the Japanese soldiers who were similar in stature to the Filipinos. In the recent Sino-Japanese War, they had proved their excellence. Besides, it would instill optimism and confidence in the ranks of the revolutionists to know that they were using guns from Japan, who had thrown off the shackles of Western domination.

Following a long search, Ponce was able to purchase a vessel, the 1,441-ton *Nonubiki Maru*, for transporting the shipment. Registered in the names of a Japanese and a Chinese, it proceeded from Kobe, its home port, to Nagasaki where the arms were loaded. The vessel's cargo included the ten thousand Murata rifles, six million rounds of ammunition, eleven field guns and cannon, one pressing machine for gun powder, materials for the manufacture of cartridges, and miscellaneous items such as field glasses. Successful in leaving Japan by way of the port of Moji, the *Nonubiki Maru* encountered a severe typhoon when about one hundred miles from Shanghai and sank on July 19, 1899.

Disclosures by the Japanese press prompted the American Legation at Tokyo to undertake a thorough investigation of the *Nonubiki Maru's* activities. The American naval attache confirmed that the vessel had

been engaged in a filibustering expedition and, as a consequence, the United States Government addressed a formal note to Japan's Minister for Foreign Affairs and asked for an explanation of the affair. The Tokyo Government replied, after a lapse of time during which it apparently conducted an investigation of its own, that the *Nonubiki Maru* was able to elude Japanese port authorities because its destination had been declared to be Formosa. Communications from Ponce to Aguinaldo indicated, however, that key Japanese officials had participated in the undertaking. Throughout his correspondence, the Filipino representative spoke often of the "Japanese Government" and of "Japanese officials" having a major role in preparing the expedition. For example, he asserted that the "Japanese Government" had originally furnished him the name of the "military officer who was to make the necessary arrangements with him."

Another interesting aspect of the *Nonubiki Maru* case pertained to a plan whereby Japanese volunteers were to join Aguinaldo's militia in the Philippines. With the enthusiastic support of the Black Dragon Society, Ponce proposed that the volunteers be split into two groups, the first of which left Japan and entered the Philippines by way of Hongkong. This contingent included eight or ten men and was headed by a former captain of artillery in the Imperial Bodyguard Division. Slipping through Dewey's blockading vessels, they landed at the port of Orani in Bataan and reported to various headquarters of Aguinaldo's forces. The captain and a second Japanese officer went to Zambales where they joined General Tomas Mascardo, who commanded the revolutionary forces in that sector. It was here that the two Japanese became the warm friends of Manuel L. Quezon, destined to be the first President of the Philippines and a key figure in World War II. Quezon, then a major in Aguinaldo's army, was Mascardo's chief of staff. His association with the Japanese volunteers was the initial link in a long chain of events which involves a little known but highly important aspect of Japanese-American-Filipino relations prior to and during World War II.

Coupled with the *Nonubiki Maru* disaster,

Filipino revolutionary cause had suffered reverses at Hongkong in additional attempts to secure arms and ammunition. It was at the British crown colony that Aguinaldo's representatives tried unsuccessfully to obtain a large quantity of German Mauser rifles and other munitions from local groups of international adventurers.

Meanwhile, Ponce managed to make a second shipment of rifles and ammunition to the Philippines via Formosa. After arriving at the Japanese colony, they remained there for a considerable period of time because of difficulties encountered in securing transportation to Filipino-held territory, which was becoming increasingly small.



U. S. Navy Photograph

A SPANISH WRECK AT MANILA BAY

Scarcely had Dewey's victorious guns ceased fire before Aguinaldo was negotiating with Japanese leaders for arms for the insurrection.

Sun Yat-sen, still present as a factor in these filibustering activities, made arrangements to use the munitions to arm his followers in China. Filipino sources claimed that the Chinese leader failed to make payment for them, a development which placed a severe strain upon his friendship with Ponce. Viewed from the standpoint of Japanese policy, this second attempt by Ponce was perhaps the most significant of all for it was reasonable to assume that the interest of the Governments of both Japan and the United States in the *Nonubiki Maru* case would have made it impossible for the Filipino and his Japanese associates to continue their activities. Moreover, it is not without importance that Ponce was able to carry on his intrigues until the very end of Aguinaldo's resistance free of any interference from the Japanese Government.

Largely concealed, but not entirely so, from American eyes, the joint intrigues of Aguinaldo's followers and the Japanese secret societies had helped to sow the seeds of suspicion among high-ranking American military authorities as to Japanese policy. This development, initiating an opposite trend from the cordial Japanese-American relations which had existed for nearly half a century, was indicated by a dispatch sent to Washington on December 28, 1900, by Major-General Arthur MacArthur, who had become commanding officer of the United States Army in the Philippines:

Many papers belonging to Trias, secured recent capture, one of which contains Filipino account conferences between Japanese consul and Trias in remote part of Cavite province October 11, this year. Paper carefully prepared, authenticated by Filipino secretary, measurably confirmed by other captured papers, most probably true. I accept it as such without hesitation. Consul advised that Trias visit Japan to negotiate voluntary contribution of arms, and, concerning future of archipelago. Filipinos represented that concessions which they might be forced to make to Washington would be more agreeable if made to Japan. . . . Consul said Japan desired coaling stations, freedom to trade and to build railways. That individual Japanese have aided insurgents has been more than suspected, but if official intervention and encouragement has transpired, a new and strong light is thrown on the situation—sufficient, perhaps, to account for defiant attitude of many leaders, especially the wavering policy of

Trias, who on several occasions has apparently been on verge of surrender, and also explain unyielding character of resistance in southern Luzon. In view of delicate international questions involved, shall act only under advice of Department Papers by mail.

This dispatch by General MacArthur, written in a direct style not unlike that to be used some forty-odd years afterward by his more famous son Douglas in communiques which were to describe Japan's conquest of the Philippines and its liberation by the United States, caused a mild sensation in Washington and Secretary Hay immediately requested rigid investigation and proper discipline by the Japanese Government to prevent its agents from covert intercourse with insurgents. The Foreign Office at Tokyo reviewed the incident and reported that the Japanese consul at Manila had actually held a chance interview with the Filipino insurgent leader Trias. Although minimizing its importance, the Japanese authorities transferred the consular official to another post and the United States Government declared the matter to be closed.

In the final analysis, the Japanese imperialists had been unable to lend effective aid to Aguinaldo's cause. The sinking of the *Nonubiki Maru* and the second but abortive filibustering expedition from Japan via Formosa, coupled with the equally unsuccessful endeavors at Hongkong, consumed most of the money which the Filipino insurgents had available for the acquisition of arms and ammunition. This series of reverses far removed from the battlefields in the Philippines, constituted one of the underlying reasons for the complete defeat of Aguinaldo and his followers by the American forces. On the other hand, last-minute hope of assistance from Japan contributed to prolong the conflict and thereby produced the loss of more American lives before peace was finally restored in the Philippines. In this connection, it is interesting to note that Manuel L. Quezon, who had associated with the two Japanese Army officers sent by the Black Dragon Society to the Philippines, was among the Filipino die-hards whose surrender to the American authorities came long after the main strength of Aguinaldo's guerrillas had been crushed.

It is now apparent that when the United States acquired the Philippines fifty years ago, American responsibilities were bound to come in direct conflict with Japanese imperialistic ambitions. Despite the surface indications of Japan's friendly attitude towards the American Government, the Japanese were determinedly following the path of empire and there can be little doubt that they regretted their inability to obtain the Philippines for themselves in 1898. At that time, the Tokyo Government's hands were tied and a policy of expediency was adopted. Needing American as well as British cooperation to check the inroads made by France, Germany, and Russia in China, Japan considered it inadvisable to take any official steps which would oppose the United States in the Philippines. The Japanese, glancing at a map of the world, realized that the Americans would find it difficult to defend the Islands in any subsequent war between Japan and the United States. The erstwhile hermit kingdom had formulated sound strategy in dealing with the Western powers, counterbalancing them against one another, the combinations varying according to the circumstances. In this fashion the Japanese continued to strengthen their position at the expense of the others, and without much regard to the ethics.

Shortly after the termination of the Spanish-American War, an incident oc-

curred which indicated the exact manner in which Japan regarded American sovereignty in the Philippines. Having acquired territory in the Far East, the United States redoubled its interest in that area. The famous Open Door notes soon followed. Secretary Hay felt that it might be desirable to acquire a naval station on the Chinese coast. Formally sponsoring this project, he sent a cipher telegram to the American Minister at Tokyo on December 7, 1900:

The Navy greatly desires a coaling station at Samsah Inlet north of Fuchow. Ascertain informally and discreetly whether Japanese Government would see any objection to our negotiating for this with China.

Despite the American enthusiasm for this project, the Japanese Government subsequently reported that it could not accede to the proposal. Content to tolerate the presence of the American flag in the Philippines, Japan was determined that the United States should not secure additional bases on the Asiatic mainland. On another December seventh, forty years later, the Japanese launched their treacherous attack on Pearl Harbor and began the war against the American people which resulted in the loss of an empire which had taken nearly a century to build.



AVAST, YOU LUBBER

Contributed by CAPTAIN J. M. BOYD, U. S. Navy

All are familiar with the difficulty encountered in training telephone talkers on board ships. One of the major obstacles to overcome in this procedure is to convince the candidate that he must repeat verbatim whatever message is received over the phone. The talker will feel that his own phraseology is better for expressing the same thought. Thereby hangs the tale—

The "special sea detail" station of the gunnery officer was the fantail, and he had the gunnery office yeoman for his telephone talker. The ship was being placed alongside a pier at Pearl, lines were out fore and aft, and the operation was proceeding smartly. The pilot asked the executive officer, "Please have the fantail avast heaving." The executive officer indicated to the bridge talker to tell the fantail to avast heaving. The bridge talker had some difficulty making the fantail talker understand but the stern line finally slackened and operation of securing alongside was completed.

Later, over a cup of coffee, the gunnery officer related the following: He was anticipating the order and so was watching his talker when the word came over the phone. The talker looked puzzled while the bridge talker repeated the order several times. With an expression of relief, the talker finally turned to the gunnery officer and said, "The bridge said 'Heave Faster'."

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS.)

THE GOOD SPEAKER



1. Motivates and Challenges Audience
2. Talks Directly to Students
3. Adapts Speech to Audience
4. Uses Language Students Understand
5. Thinks Ideas as He Presents Them
6. Emphasizes Important Points
7. Maintains Poise
8. Speaks Clearly and Distinctly and Varies Intensity of Voice
9. Uses Gestures Properly

NO PLACE FOR DUMBNESS

Every naval officer, regardless of rank, must make speeches, either as addresses or in training his men. And the earlier he learns, the better for him.

THE NAVAL OFFICER AS A SPEAKER AND INSTRUCTOR

By CAPTAIN I. E. McMILLIAN, *U. S. Navy*

IN THESE times of rapidly advancing techniques and scientific complexities it is necessary, more than ever before in our history, for naval officers to become effective speakers and good instructors. Much of our time now, and an increasing amount of our employment in the future, must necessarily be devoted to the education and indoctrination of others. Hit and miss methods are not at all acceptable and an intelligent appreciation of what is required of a speaker-instructor is of urgent importance to all of us.

A considerable portion of an officer's career is spent either in attending schools or in conducting some kind of instruction. (Training a group of gunner's mates on a 5-inch, 38-caliber mount is as much of a school job as giving a lecture.) Flag officers, in particular, as representatives of the Navy Department and of the Nation are frequently called upon to present the Navy viewpoint upon problems of national import. And most of us, on one or more occasions, when visiting the old home town, have been called upon to make a few sage remarks before the local Lion's Club.

It has long been customary in the Navy to assume that any officer, particularly a line officer, can accomplish any task assigned him. This tendency is based upon the truism that the Navy assumes that each officer can and will adapt himself to any duty or assignment to which ordered. How does this apply to his assignment as an instructor? In many cases the individual applies himself and may even study public speaking and the theory behind the delivery of instruction. But it is submitted that many others, possibly through ignorance and no fault of their own, never learn anything definite about the principles of instruction and the processes associated therewith. Most important, they never comprehend that students can be scientifically persuaded to absorb learning whether they want to or not. The know-how

is certainly available in one form or another; the problem is how to get it to those of us who have to speak and teach.

Elaborate studies have been made of the problems involved in achieving good instruction, and a multitude of books have been written on the subject. All naval officers should be given an opportunity to find out about the developed techniques of instruction and to learn the "tricks" that are used to appeal to the students in such a fashion as to make them *want* to learn.

Where may the principles of instruction be found and studied? There are three military pamphlets which will suffice for the beginner naval instructor. One is published by the Bureau of Naval Personnel and is called NavPers 16103, "Manual for Naval Instructors." Another is TM 21-250, "Army Instruction," that can be obtained from the Army Department. The last publication of the three cited is titled MCS 2-6, "Manual for Instructors," and is published by the Marine Corps Schools, Quantico.

In addition to the above mentioned printed sources of information there are two valuable 16mm training films that will interest and aid the embryo instructor. One is

A GRADUATE of the Naval Academy in 1930, Captain McMillian had early sea duty on battleships and submarines as well as attending Submarine School, Postgraduate School, Chemical Warfare School, and Marine Corps Schools. Later, on the destroyer *Hull*, he fought the Japs at Pearl Harbor, New Guinea, and Guadalcanal. As Gunnery Officer, PhibsPac and PhibGru 3, he participated in landings at Attu, Kiska, Roi-Namur, and Guam. He commanded the destroyer *Newcomb* in the landings at Leyte, Ormoc, Mindoro, Lingayen Gulf, Iwo Jima, and Okinawa. Later Gunnery Officer, ComPhibTracPac, and Officer in Charge, Gunfire Support School, Coronado, he is at present Operations and Training Officer on the Staff on ComServRon One.

MN 5795 G, "Methods of Teaching," which stars Robert Taylor and is issued by the Navy Department. The best, featuring the character actor, Robert Barratt, is named TF 7-295, "Military Training," and may be obtained from the Army Department.

GENERAL INSTRUCTIONAL CONSIDERATIONS

The secret to success as a lecturer or speaker depends upon the subject knowledge of the expositor, together with the amount of his preparation for the presentation. These two factors are intimately connected and cannot be divorced from each other if effectiveness is to be achieved.

Although a speaker may be an authority on a subject assigned him and may in fact know all about the topic, it is still necessary for him to go through certain steps to ready himself for a particular platform presentation.

Mark Twain was known as one of the most accomplished extemporaneous speakers of his time. He confessed, however, that the worst moment of his life occurred when he attempted to make what actually was an extemporaneous speech. This was the first and last such attempt for him. Thereafter all his "extemporaneous" speeches were well prepared in advance.

A speech certainly loses its effectiveness if read closely from a prepared paper. In case an instructor is required to deliver a speech or lecture, and the particular situation, perhaps radio broadcast timing, demands that it be read, then the speaker must study his material so well in advance of delivery that the audience will not ever suspect that it is being read. This can be achieved by reading the talk aloud several times so that, when actually delivered, it will be possible for the speechmaker to glance at his paper and then utter an entire sentence at a time without further reference to the written text.

A speaker who reads his speech verbatim loses naturalness, and is apt to deliver it too rapidly for absorption by the listeners. Unless especially gifted, the man who reads his speech loses the interest of his audience and his delivery loses most, if not all, its value.

It is a fact that an instructor can force an audience to learn even if it is entirely hostile

and not desirous of learning at all. This requires a properly indoctrinated instructor who can make judicious use of training aids and who can appeal to the learning instinct and innate ability of the individuals that compose the audience. In this connection, an audience should be analyzed carefully and the speaker should adopt the most effective approach required for the particular gathering.

THE SPEAKER

The nervous speaker should take a few deep breaths before facing his audience, inhaling and exhaling deeply several times (as is he were going to swim underwater). When he arrives on the platform it is safe to move the lectern a bit and otherwise to check his equipment. These physical movements involve some exercise of the body and actually give a sort of relaxation to the speaker about to sound off. By the time the maneuvers are over he will possibly find that the floor hasn't fallen in and that the audience has taken no action toward committing mayhem upon his person. He may then feel fairly secure and go ahead with his introduction.

If a person knows for sure that he will be nervous he may write out, word for word, the first few minutes of his speech. As a last resort he can then put his quivering head down and read until sufficient courage is mustered to raise his eyes and face the sharers of his undoubted misery (who are sympathizing with him from the floor).

The personal mannerisms of the speaker should not be allowed to fascinate or distract the audience. You have all watched the individual who rattled coins in his pocket, the one who scratched his head continuously, and the captive lion who paced up and down in his cage. It must be remembered that there are always people in an audience who are inclined to mathematical calculations—they will keep a running account of eccentricities of the speaker, to the disadvantage of the material being presented. For example: how many times one speaker polishes his glasses during a lecture period.

The key to present day effective speech making is simplicity. The day of bombastic oratory is definitely ancient history. This

particularly to naval officers, since, when you or I get up on a platform we are not running for public office or we are attempting to "teach" or to impart certain information.

A naval officer should beware of too much slang, salty expressions, and the like, which is important even when speaking to a completely familiar with them.

A good speaker can control audience attention by his voice control. The attention of the audience can easily be alerted by either lowering the pitch or tone of the voice. The same effect is accomplished by the volume. A certain relaxation results when the normal pitch and volume are resumed. The speaker must avoid, however, of a monotonous, non-

varying voice. Franklin D. Roosevelt was the master in commanding audience attention by deft voice control.

An important "attention getter" is the eye contact between the speaker and a succession of individuals in the audience. Certain persons then get the idea that the speaker is talking directly to them and they therefore listen naturally and eagerly. In classroom work this eye contact can accomplish wonders with the drowsy ones who have trouble in keeping their eyes open.

At times, the audience must be momentarily rested. This can be accomplished by movement of the speaker on the platform. Just a walk to the opposite side of the dais will give them a rest, a break.

The use of jokes in speeches or lectures is



with Pencil



Body Weight Shifting



Clothing Adjusting



Fumbling with Watch



Hiding



Hiding Instructional Material



To and Fro
Body Swaying



Flying Hands

DON'T DO THAT!

Avoidance of personal mannerisms on the platform is one of the fundamentals of good speaking or lecturing.

not recommended for the novice. This applies particularly to the naval speaker. If a joke is told, however, the joke must be known so well that it is no longer funny to the speechmaker. If the latter can raise a mild chuckle now and then, there will be a definite relaxation in any tension that is present. The speaker must refrain from competition with characters like Fred Allen because a raucous belly-laugh from an audience may perhaps serve to destroy the important pattern of the talk.

The speaker cannot afford to antagonize his audience in any shape, form, or fashion. This can result from talking down to the listeners, from rudeness or sarcasm, and from abruptness with students. Questions must be answered courteously or the propounder—and the rest of the audience—won't return later for another question. Questions and answers are stimulating and help drive home the desired points.

The instructor must possess a good command of the English language and its grammar. His pronunciation and sentence structure must be above reproach or the audience will feel sorry for him, and then he is lost.

Good taste and common sense contribute to a speaker's effectiveness if he possesses them. By making vulgar remarks the speaker runs an unnecessary risk of antagonizing his audience. The same applies to misplaced jokes.

Dr. Henry G. Roberts, associate professor of speech at George Washington University, has formulated a series of five DO's and five DONT's that he feels are particularly valuable for naval officer public speakers. The DO's are: (1) *Do it* (don't try to say you're too busy when asked to give a speech); (2) *Do it yourself* (don't palm it off on a junior officer); (3) *Do keep it simple*; (4) *Do keep it short*; (5) *Do what you would do in conversation, look at the man you're talking to*. The five DONT's are: (1) *Don't apologize* (the audience doesn't expect a professional spellbinder); (2) *Don't put too much reliance on the supposedly funny story*; (3) *Don't open your speech by announcing your subject* (if your opening sentences are striking, interesting, and attention compelling, your audience will be on your side, will be eager to hear what you have to say); (4) *Don't try the impossible, you can't be effective with a*

speech manuscript in front of you; (5) *Don't forget the man in the back row*.

Mr. Roberts further explained that a good speech should: (1) have a message; (2) be natural; (3) be sincere; and (4) radiate enthusiasm.

The reader should realize, at this point, that there is a considerable amount of technique involved in delivering a good speech or a lecture, and that a careful research of all that is involved is a necessary undertaking for a would-be speaker. Now, how about the instructor?

THE INSTRUCTOR

It has been estimated that about fifty hours of research, preparation, and rehearsal are required preparatory to delivery of an outstanding one-hour talk. Most of us cannot devote that much time to one lecture, especially if we have to present thirty or forty such dissertations in the course of a year. The comparison, though, does give an idea of what is required.

When a naval officer is detailed to give a lecture he falls into one of three categories: (1) he knows nothing about the subject; (2) he is familiar with the subject but has never lectured on it; (3) he is familiar with the subject and he has lectured on it.

If he is in the first category, the primary task will be to become familiar with the subject matter. This will entail a considerable amount of research that will be directly proportional to the impression that the speaker desires to achieve and the extent to which he desires the subject exploited.

If in the second category, the speaker must decide how much and in what order the subject matter shall be covered. This also requires considerable research.

If the speaker comes within the third category, he is a fortunate man. All that is required is to brush-up on the facts at hand, adapt them to the audience, and set forth.

Most of us will come under the second category—not only know our subject but want to talk about it when we start out on our first assignment as an instructor.

The steps that must be followed in preparing a lecture are simple. It is decided exactly what will be presented, how much will be presented, and what material the audience must be expected to retain. The

amount to be retained is most important of all.

In order to insure retention of the material desired the instructor must: (1) present the main points in an orderly and concise fashion, each point linked with the others; (2) insure that the audience, at the end of the lecture, has a clear mental picture of the main points of the lecture.

The best way to accomplish the above two essentials is to outline the talk accurately and then to build up the actual lecture from the skeletal plan of important points.

A properly considered introduction and approach to the audience are weighty requisites of a good talk. The first two minutes of a speech, particularly one delivered in a classroom, are usually wasted. The class spends at least that much time in getting comfortable, examining the speaker and getting acquainted with each other, folding their papers, last minute whispered greetings, etc. The lecturer can rarely drive home any message during this wasted zone.

The succeeding two or three minutes are the most critical in the entire lecture. The audience has met the speaker and it is beginning to decide mentally whether or not it is going to listen. If the lecturer can convince his hearers that they must listen, then they are his. If he cannot convince them he might as well take up his manuscript and go home. The good instructor winds up his introduction when he senses that the audience is settling down, and then he states why the lecture is important. The listeners normally pay attention to the statement of import and decide if they, as individuals, will profit by it.

If the speaker has come along to this point and has convinced the listeners that they want to hear him out, then he is ready to start on the body of the lecture. This body, naturally, is the most important of all since it is the essence of the lecture. What has come before has been preliminary in nature.

The outline of main points that must be deposited in the minds of the audience applies mainly to this, the body of the lecture. If an instructor is to speak for the conventional fifty minute period of instruction, he should plan on making not more than four or five main points in the body of the lecture.

If more than five main points are inserted their retention will be difficult and the assembly will not carry away the most important parts of the talk.

When the instructor finishes with the body of his lecture he must have at least five minutes left for summary. In closing he must drive home the salient points that have been discussed.

The use of training aids in the Navy is increasing and all hands are becoming conscious of their value. Training aids assist in driving home the "meat" of the presentation.

The basic reason for using training aids stems from the fact that everything that we learn from infancy on, is retained or perceived through one of our five senses—sight, hearing, touch, smell, taste. Some of these senses give a more lasting impression than others. For general purposes it has been established that about seventy-five per cent of what a person learns is by seeing, thirteen per cent by hearing, and the remainder from feeling, tasting, or smelling. The inferences are obvious. In speaking to an audience, only one channel of perception is open. If at the same time, however, the audience can be presented with something that it can see, feel, taste, or smell, then the speaker is working on several reception channels of perception.

The training aids that can be used by the naval speaker include slides, posters, models, movies, blackboards, etc. Each of these has certain advantages and disadvantages. The instructor must consider each carefully and should use the ones most appropriate to the task at hand.

The ordinary lantern slide projector is a superior training aid and, despite the feeling of the inexperienced, it is not necessary to turn out classroom lights to see slides projected by this method. If the slides are manufactured with black letters or lines on a white background, they can be readily seen with all lights left on. (The snapping on and off of lights in a classroom is definitely disadvantageous. In a fully lighted room the instructor is better able to command the attention of his class.)

The theatre, auditorium, or classroom should be checked personally by the instructor well in advance of his scheduled

presentation. In some cases the speaker has a choice as to the classroom or stage to use. Usually, however, the location will have been decided for him and it must then only be adapted to the needs of the instructor.

The main points to check in the classroom include comfort of the audience (lighting, heating, ventilation); distracting influences (shiny blackboards, irrelevant posters or pictures mounted in classroom, noises); appliances (seating, electrical outlets for training aids, acoustics).

Woe be to the instructor who has built his lecture around lantern slides designed to depict his main points and who arrives in the classroom to find no slide projector or no electrical outlet, or both! Perhaps the equipment is there, but no operator! The instructor must check his classroom personally. Any failures in facilities will probably cause a delay or postponement in the class. In a tight and heavy schedule this may result in considerable embarrassment to the instructor and to the particular school.

A TRUE EXAMPLE OF A WELL-MEANING BUT INEFFECTIVE SPEAKER-INSTRUCTOR

In the spring of 1948, a naval officer who possesses considerable experience with regard to a certain region of the world completely unfamiliar to most of us was invited to make a talk about a recent expedition to this strange area. Since the subject matter was of special interest to the Navy, extraordinary measures were undertaken to insure attendance of a large number of naval officers of all ranks. Flag and general officers of the Navy and Marine Corps, together with their principal staff officers, many of whom were very senior, were forthwith assembled in an auditorium located at a certain naval establishment.

When the senior attending officer arrived at the auditorium the presentation got underway. The speaker mounted the platform and immediately launched into his speech. A fine introduction was made and the speaker seemed completely unafraid. On the contrary he was entirely confident. He talked through a pedestal type microphone and was audible to all. The talk was scheduled to last about two hours. Within five minutes after commencement, the

speaker found that he had to refer to a slide chart which was, after some delay, flashed upon a movie screen via a lantern slide projector. (There were no signals between the projector operator and the speaker, and some loud conversation between the two became necessary.) When the first slide finally became visible, the speaker left the vicinity of the microphone, turned his back to the audience, and commenced explaining the object appearing upon the screen. He could not be heard beyond the first few rows, he obstructed the audience view of the screen, and in addition he talked to the screen rather than to his audience.

The above went on for some twenty to thirty minutes. Occasionally the speaker stepped back to the microphone and said a sentence or so that could be heard by the approximately 90 per cent of the audience otherwise completely mystified as to what was being said on the platform.

Eventually the slides gave way to 16 millimeter amateur movies, explained "sotto voce" to the audience by the lecturer as he lurked in the shadows of the stage. The movie scenes were, almost without exception, invisible. Several occasions occurred where the completely black screen was seen to momentarily disclose a tiny speck. This, in each case, was explained to be a certain fascinating warm blooded vertebrate taking a stroll.

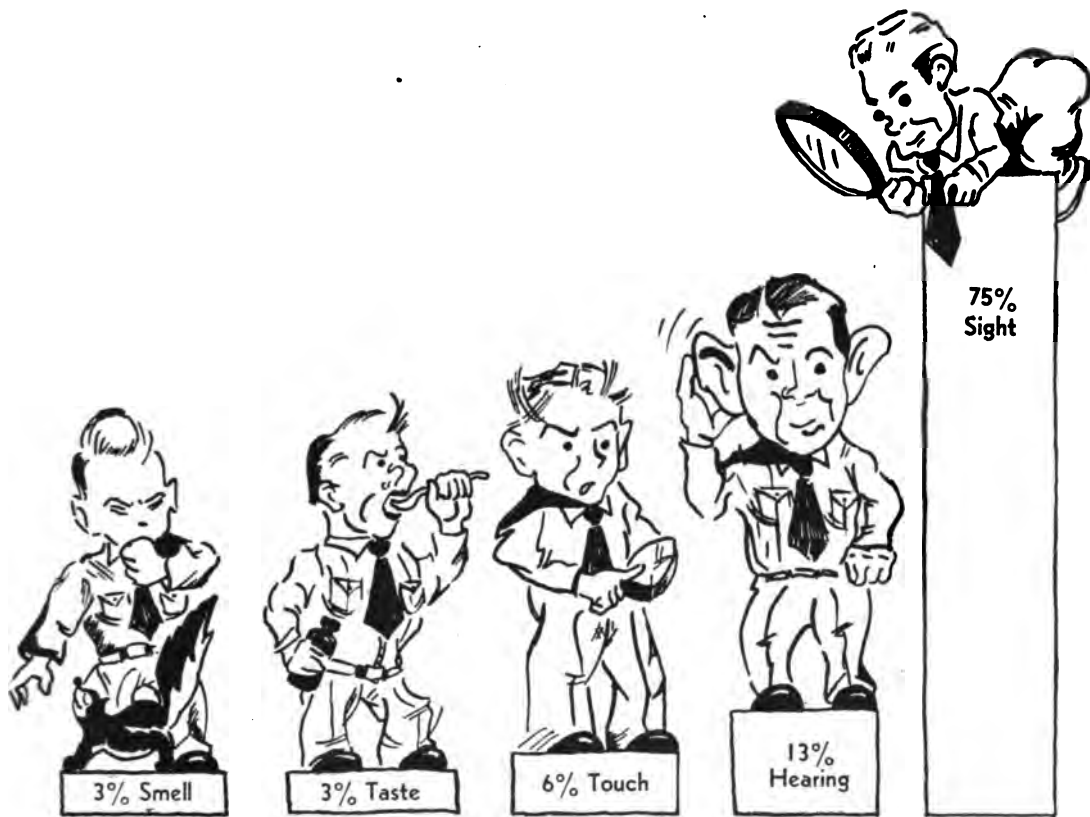
When the first painful hour came to a tragic end the audience was allowed a ten minute break for smoking and relaxation. Following the intermission, when the second hour of the presentation got underway it immediately became apparent that many from the original audience had disappeared. They did not return for the second hour.

The above experience, extremely trying to some bystanders who witnessed the event described, was traceable to a lamentable lack of appreciation by the appointed speaker of the task before him.

The following facts comprised the disturbing features of the presentation and can be traced directly to the speaker:

- (a) He did not rehearse his material.
- (b) He attempted to make a largely extemporaneous speech over a two hour period.

- (c) He failed to check his auditorium for equipment and facilities.
 - (d) No prearranged signals were utilized in controlling the employed training aids.
 - (e) Provided with a working microphone, he used it only occasionally; and al-
- tion is perhaps an authority on the region discussed. Unfortunately, however, he was constrained to keep his information to himself in the described case simply because of ineptitude on the platform and a complete lack of consciousness of the techniques of speaking effectively to an audience.



WE LEARN THROUGH ALL FIVE SENSES

And the good lecturer appeals as far as possible to all five senses.

though several hundred officers were stacked in the audience, row upon row, he talked in his normal and completely unamplified and inaudible voice.

- (f) He either talked from the shadows, completely invisible, or else stood before the screen and blocked the view of the object thereon.
- (g) The movies used were under-exposed and largely not worthwhile.

The officer who delivered the talk in ques-

A SUGGESTED SOLUTION TO THE PROBLEM

Now that we know some of the difficulties connected with instruction, how can we meet the challenge and improve our instructors or indoctrinate the ones that are yet to come?

The only positively effective method to insure the proper qualification of instructors is to give them a course of instruction in "Public Speaking" and "Preparation and Delivery of the Lecture." The texts could very well be the ones listed in preceding paragraphs. The instructors (for the prospec-

tive instructors) should be the best and the most mature that are at hand. Certain teams of officers have been made available by BuPers (by the Army and Marine Corps in some cases) to conduct some formal classes "for instructors."

The Marine Corps Schools, Quantico, conduct an "Instructors Orientation Course (IOC)" for all officers about to become instructors in the formal schools at Quantico. A staff of three permanently assigned officers, headed by a major, conducts a two weeks course that is designed to determine the capabilities (and limitations) of potential officer instructors. The staff delivers lectures on "Public Speaking" and upon "Preparation and Delivery of the Lecture," followed by actual performance on the platform by the student instructors.

The Command and Staff College, Fort Leavenworth, conducts a course similar to the Quantico IOC for all would-be Leavenworth instructors. Other principal Marine and Army educational institutions throughout the country maintain courses designed to insure that their instructors are in fact qualified. It is determined, occasionally, that certain officers are simply not instructor material. Happily for their prospective students, they may then be painlessly ordered to duty not connected with instruction.

At Quantico and Leavenworth and other similar institutions, no instructors are permitted to give a lecture until certified as qualified by the IOC board. It is submitted that this is the only proper approach to a solution of the problem.

It is possible for the Navy to maintain courses of instruction similar to the Quantico IOC. Each naval district could, for example, support a mobile team of qualified teaching experts to conduct "IOC" wherever needed in the district. Large activities devoted exclusively to training could support and maintain their own "IOC." Typical activities would be the War College, P.G. School, Naval Academy, Training Commands, Naval ROTC Headquarters, Naval Line School at Monterey, etc.

Let us suppose that an "IOC" is available at, say, the U. S. Naval Academy, and that one Lieutenant Jones, U.S.N., reports for duty as an instructor in the Ordnance and

Gunnery Department. What happens to him to get his instructor capabilities (or lack of them) out into the open?

After checking in with the Superintendent's Office, Lieutenant Jones reports to Commander Smith, U.S.N., Director of the "IOC," U. S. Naval Academy. Commander Smith has no other duty and he is assisted by two Lieutenant-Commanders. All three members of the "IOC" staff have attended special courses themselves and they know all about Public Speaking and the "tricks" of the trade, and "how to be an instructor." When not conducting an "IOC," Commander Smith and his two assistants sit in on various classes in all departments at the Naval Academy and make periodic written reports to the Head of Department concerned regarding the technique exhibited in the classroom presentation that was visited.

When Lieutenant Jones reports to Commander Smith he gives the latter a thorough account of his past teaching experience, if any. Commander Smith and his aides study Lieutenant Jones' submitted form and give him a schedule of instruction for the "IOC."

Lieutenant Jones (and the other like instructors that have reported in the meantime) listens to Commander Smith's team deliver a three or four day series of lectures on all that a good instructor is supposed to know. Training aids and all the other "tricks" are exposed to Lieutenant Jones, and he is given ample opportunity to ask questions and have them answered fully and intelligently.

After hearing the series of staffs prepared lectures, Lieutenant Jones starts to work on his own. He is handed an object, which could be a pencil, a lighter, or any other convenient device. He is then directed to move to the platform and deliver a three minute extemporaneous speech upon the subject delivered him. Commander Smith et al., together with the listening embryo instructors available, comprise an audience and observe Lieutenant Jones closely. A microphone is about his neck and a record is made of his remarks. As far as this first speech is concerned, all that is required is that he keep talking uninterruptedly about the device until the three minutes are up. This test is intended only to show the speaker's presence

of mind and ability to think on his feet.

This first attempt will acquaint the "IOC" staff with certain characteristics of Lieutenant Jones. Also they will learn if he is nervous and if he has any serious and objectional platform mannerisms.

When the speech is finished, each member of the audience and staff is called upon to make brutally frank comments on the performance of Lieutenant Jones. Commander Smith sums up the faults and good points of the speech and sends Lieutenant Jones to another room to listen to his voice played back on the recording. This playback may surprise him. His voice may be squeaky or he may sound like Crosby. In any event, corrective action begins in the minds of Lieutenant Jones and the "IOC" staff, if any is needed. Many cases require no corrective action at all, but simply "brushing-up."

Lieutenant Jones is next given a full day to prepare a six-minute speech on a naval subject. For example: "Are 5-Inch, 38-caliber Anti-Aircraft Guns Obsolete"? It is best to allow him to select his subject from a list of a dozen or more naval topics made available to him by the "IOC" staff.

When ready, Lieutenant Jones submits a complete outline of what he intends to say, and then mounts the platform and delivers his speech. He must finish his talk close to the appointed time, he must follow the outline approximately, and he must use the proper platform manner. Again the audience and staff criticize him, and once more he plays back and listens to his recording.

Finally, Lieutenant Jones selects a naval topic, at his own discretion, and prepares a 30 minute or a 50 minute lecture. He is required to submit a complete outline based upon the selected subject. He must follow the technique of instruction taught to him by the "IOC" staff. He must accomplish certain research and prepare his own training aids or arrange to have them made. A complete rehearsal must be gone through and he must deliver the lecture within a minute or two of the allowed time. (In this connection

a speaker cannot finish too soon or go over in time when conducting a class in a school that must follow a time schedule. Insistence upon good timing impresses Lieutenant Jones with the necessity for careful preparation and delivery of his material. Students become hostile to a lecturer if he habitually runs overtime and deprives them of their "break" before the succeeding class. On the other side, an instructor who finishes too soon is inefficient, since he does not keep the students occupied during all their assigned period.)

Upon completion of the final speech, the "IOC" staff goes into a huddle and makes certain recommendations to the head of department concerned regarding Lieutenant Jones' ability as an instructor. If he is manifestly not suited to be an instructor they say so, and arrangements are quietly made to utilize Lieutenant Jones in a billet not connected with teaching.

If fully qualified by the "IOC" staff—and most officers can qualify easily—Lieutenant Jones begins his career as a teacher. He continues to study from pamphlets furnished him by the "IOC" staff, and he gradually becomes a fully qualified instructor. Commander Smith and his staff are available to advise him, at any time, regarding instructional techniques.

RECOMMENDATIONS FOR THE FUTURE

Effective and capable instructors are generally the products of effective and capable training programs conducted for their particular individual benefit. It is believed that an officer, therefore, before being assigned duty as an instructor, should undergo a comprehensive course of instruction.

The scope of the Navy educational program is such that it involves most, if not all, the personnel in the service. The establishment and maintenance of formal courses of instruction in "how to instruct," for officers about to be assigned to instructional duty, is of vital importance to the successful training of our Navy.





Official U. S. Navy Photograph

THE U. S. NAVY'S FIRST SEAGOING MARINE OFFICER

Captain Daniel Carmick enlisted and commanded at sea the Marine Guard of the U.S.S. *Ganges*, first man-of-war to put to sea for action after creation of the regular U. S. Navy.

THE U. S. NAVY'S FIRST SEAGOING MARINE OFFICER

By CAPTAIN LUCIUS C. DUNN, *U. S. Navy (Retired)*

present "triphibious" era when United States Marines constitute a dynamically potent component of our armed forces, on land, on sea, in the air, it is especially interesting to go back to the very early days of the United States Navy and seek to identify the first American seagoing Marine officer, the "first seagoing" here being used in the sense of going to the first Marine officer to go to sea with the Navy after adoption of the term.

Historical documentary history found in the archives reveals that individual's Daniel Carmick, First Lieutenant of Marines, attached to and serving on the U.S.S. *Ganges*, during the early years of the undeclared Franco-American War of 1798-1801.

In the early days of the Nation's history, before passage of the Congress creating the Navy Department as an executive department of the Government, as also before passage of the Act of May 11, 1798, establishing the U. S. Marine Corps, the officer commanding the guard on board American naval vessels, by law, designated by the title of First Lieutenant of Marines.

The national emergency which evolved from the unwarranted capture and confiscation of American merchant vessels and French privateers, during the European disturbances following in the wake of the American Revolution, was the prime cause of naval expansion and mobilization at that period, culminating in the naval war with France. A typical example of the harrowing experiences to which American flag shipping was subjected in these perilous times at sea is found in the following case cited by the Secretary of the Senate Committee of Commerce and Fisheries:

The Sloop *Olinda*, William Darnel, Master, from Savannah bound to Jeremie with lumber, tobacco & live-stock, was captured on the 17th June 1797 by a French privateer, called *L'Espiegle*, Capt. Barre, who ordered her to St. Juan in Puerto Rico. They robbed Capt. Darnel of all his sea-cloaths, bedding, books, quadrants, &c. He entreated them to let him remain with his vessel, that he might see her condemned, which they peremptorily refused. On the next day they fell in with an American sloop, on board of which they put Capt. Darnel & three of his men, keeping the Mate & two more in the *Olinda*.

Spring of 1798 found U. S. Naval mobilization energetically underway, with the three famous frigates, *Constellation*, *Constitution*, and *United States*, being rushed to completion and manned, while American merchantmen were being purchased by the Government for conversion into men-of-war to augment our naval forces in the protection of United States seaborne commerce from the French depredations.

The *Ganges*, of Philadelphia, was one of the merchantmen purchased for that purpose, on May 3, 1798; moreover that vessel, in command of Captain Richard Dale, U. S. Navy, was destined to be the very first U. S. Naval vessel to put to sea for engaging in that war, with Daniel Carmick occupying the billet of First Lieutenant of Marines on board.

In connection with fitting-out the *Ganges* as a man-of-war and with her preparation for sea at Philadelphia, the Secretary of War, on May 5, 1798, issued the following

CAPTAIN DUNN is a graduate of the U. S. Naval Academy, Class of 1909. He has specialized in research pertaining to various phases of U. S. Naval History, and he edited the first three volumes of the documentary series, *Quasi-War With France, 1798-1801*, published by the U. S. Navy Department.

orders to "Dan'l. Carmick Lieut. Marines on board the *Ganges*":

Sir: The President of the United States, by and with the Advice and Consent of the Senate, having appointed you a Lieutenant of Marines on board the Ship *Ganges*—

You will be pleased to commence the recruiting the Complement of Marines allowed by Law to the said Ship, to wit: One Searjeant, One Corporal, One Drum and Fife, and Twenty-one Privates. In performance of this Duty, you will pay particular Attention to the Rules and Regulations hereinafter mentioned. . . .

Given at the War Office of the United States, this fifth day of May, A.D. 1798 and in the Twenty-second year of the Independence of said States.

It is here worthy of mention that although the Navy Department had been established by the Congressional Act of April 30, 1798, Secretary of the Navy Benjamin Stoddert did not take the oath and assume the duties of his office until June 17; hence the foregoing orders to Lieutenant of Marines Carmick were issued from the office of the Secretary of War.

As the twelve articles of the Recruiting Rules and Regulations which were embodied in Secretary of War James McHenry's foregoing orders to Lieutenant Carmick are particularly indicative of some interesting phases of service personnel problems existing in those days they are quoted:

1st. It being essential that those who enlist, should feel an Inclination for that kind of Life, no indirect Methods are allowable to inveigle Men into the Service of the United States; it is forbidden therefore to enlist any Individual while in a State of Intoxication, or to have him sworn untill twenty-four hours after he shall have signed the Enlistment.

2. No Individual is to be enlisted (Musicians excepted) who is not five feet and six Inches high without Shoes, and above Eighteen and under Forty Years of Age. He must be healthy, robust and sound in his Limbs and Body, and of a Make to support the Fatigues and acquire the honors of a Soldier.

3. No Negro, Mulatto or Indian to be enlisted nor any Description of Men except Natives of fair Conduct or Foreigners of unequivocal Characters for Sobriety & Fidelity. Any recruiting Officer enlisting a vagrant transient Person, who shall desert, shall reimburse out of his Pay the Loss sustained by such desertion.

4. The Recruits are to be enlisted to serve the Term of one Year, unless sooner discharged. The Monthly Pay allowed them will be as follows viz't—Serjeants, Nine Dollars; Corporals, Eight Dollars; Musicians, Seven Dollars; Privates, Six Dollars, two Dollars whereof, may be advanced them, at the Time of their being sworn. To reimburse the Cost of attesting the Recruits, and other necessary Expences, One Dollar will be allowed for every Recruit duly enlisted.

5. Each Recruit before he is sworn, is to have distinctly read to him the Rules and Articles of the Navy against Mutiny and Desertion and such Acts of Congress as concern his Pay, Duties and the public Engagement.

The Oath shall be as follows, to wit: I——do solemnly swear to bear true Allegiance to the United States of America, and to serve them faithfully against all their Enemies or Opposers whomsoever, and to obey the orders of the President of the United States of America, and the orders of the officers appointed over me according to the Articles of the Navy.

6. No Recruit is to be permitted to keep in his possession after being sworn any of his Clothing, except that which he may receive from the Public. The Officer is therefore to oblige him to dispose of his private Clothing immediately, or to take the keeping of it upon himself till an opportunity offers to sell it for account of the Recruit.

7. No Recruit is to be allowed to absent himself from his Quarters, till such Time as he has proved himself faithful without a Corporal or trusty Private to attend him.

8. Each Recruit after being sworn, is to be attached to a Squad to consist of a Number sufficient to form a Mess, who must live together and be under the Inspection and Command of a Sergeant or Corporal.

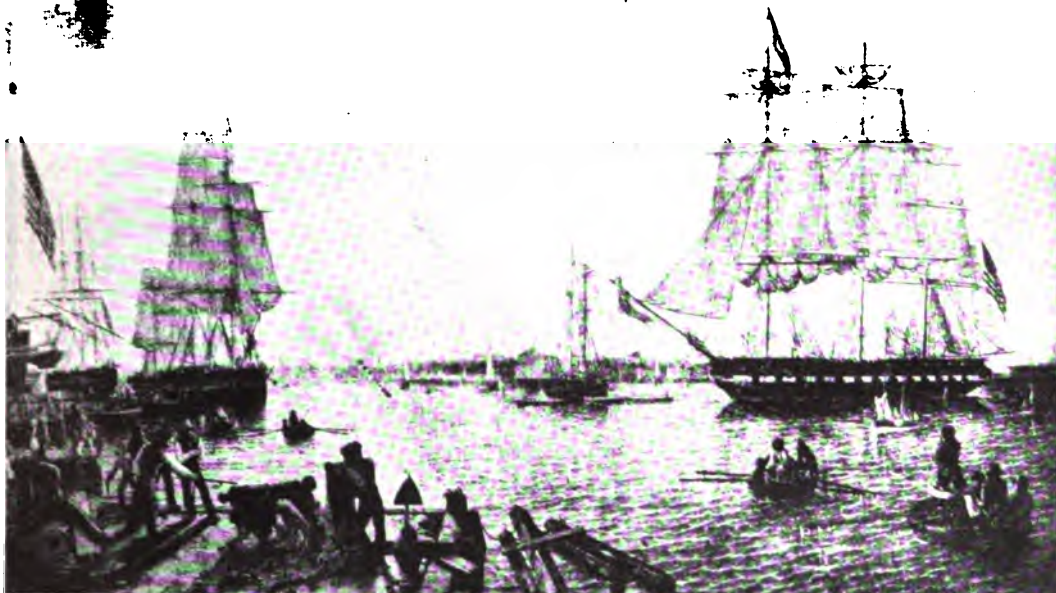
9. The Commanding Officer of a Recruiting Party, shall make out on every Saturday, a Return of the Number of Recruits under his Command and of the Number joined, and of the Incidents that have taken place and the Arms, Accoutrements and Clothing, delivered them during the Course of the Week and transmit the same to the Secretary for the Department of War, and a Duplicate to the Commander of the Ship to which he belongs.

10. He shall keep a Recruiting Book, in which he shall record—

The Name, Trade and Description of each Recruit.

A Copy of the Oath taken before the Magistrate signed by the Magistrate and Recruit. The Money paid to every Recruit.

The Articles of Clothing, Arms & Accoutrements delivered each Recruit.



Official U. S. Navy Photograph

RETURN OF THE CONSTITUTION

Captain Carmick later commanded the Marine Guard on the *Constitution* during the Quasi-War with France, served ably against the Barbary pirates and in the War of 1812, and died eventually of wounds received in the Battles of New Orleans.

11. The Commanding Officer at each Rendezvous will sign Returns for the Issues of all Rations and other necessary Supplies for the Recruits, and on the Saturday of each Week, the Returns made in the Week are to be taken up, and one general Return made out and signed for the Rations received in the course of the Week noticing the daily Issues.

12. On the Desertion of a Recruit, besides the usual Exertions and Means to be employed on such Occasions, the Recruiting Officer will transmit as soon as possible a description of the Deserter to the Secretary of War, and will cause all Descriptions of Deserters that may be sent to him to be entered in a Book kept for that Purpose, and will use his Endeavours to discover and apprehend all Deserters.

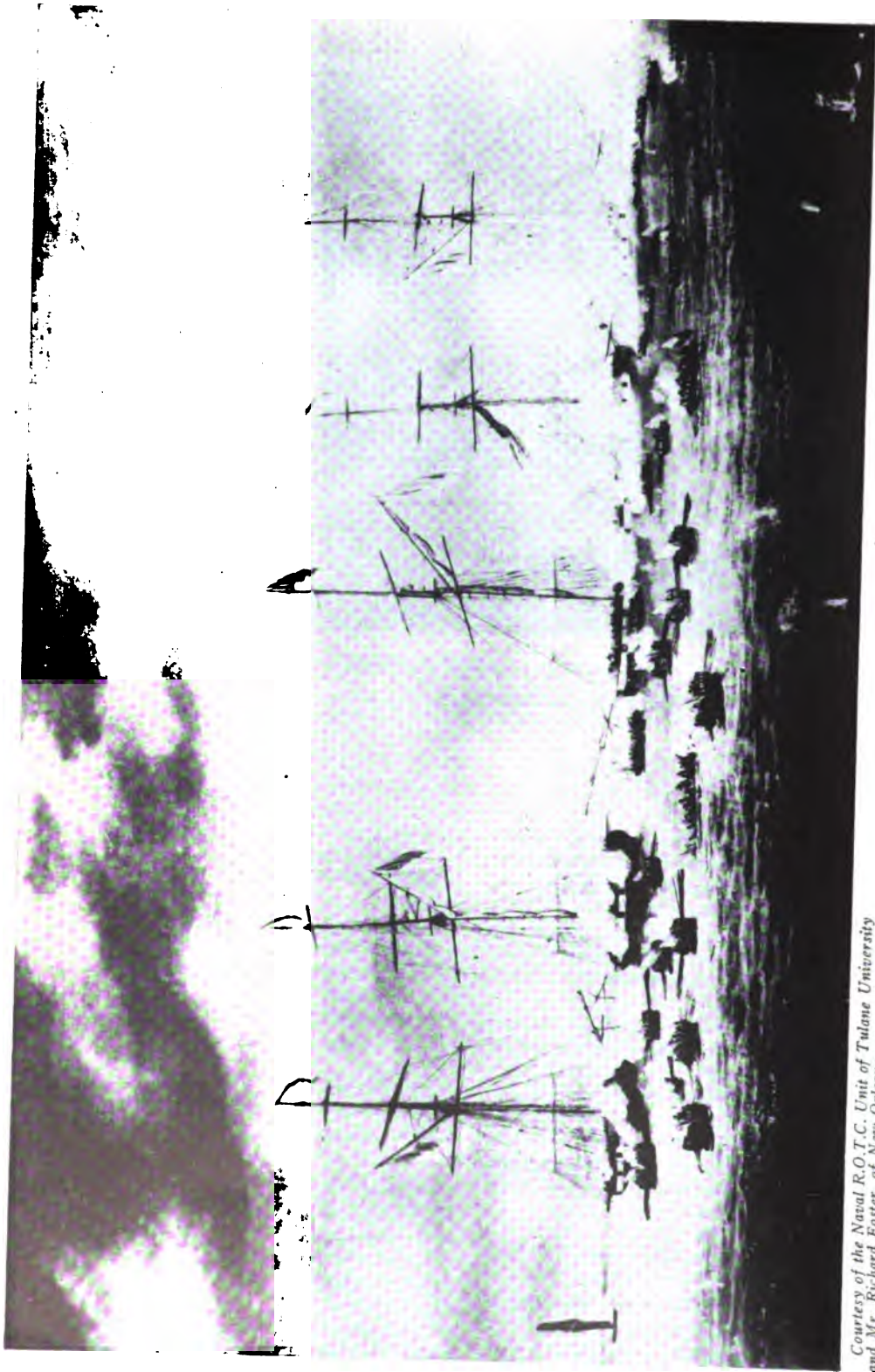
Lieutenant Carmick accordingly having recruited his Marine Guard, the Secretary of War, on May 21, 1798, issued instructions to the Navy Storekeeper at Philadelphia "to deliver to Lieut. Carmick for the Marines on board the Ship of War *Ganges* the following Articles, Vizt:

1 Serjeant's Coat, 1 Waistcoat, 1 Pantaloons.
 2 Music Coats, 2 Waistcoats, 2 Pantaloons.
 21 Privates Coats, 21 Waistcoats, 21 Pantaloons.
 48 Shirts
 26 pairs of Shoes
 1 Musket complete
 1 Bayonet.
 1 Fife and case
 2400 Musket Cartridges.

On May 22, the Secretary of War issued to Captain Dale the following operation orders for the *Ganges*:

Sir:

Although Congress have authorized the arming, equipping and employing a Number of Ships, an evident object of which is the Protection of the Commerce of the United States, yet as Congress possess exclusively the Power to declare War, grant Letters of Marque & Reprisal, and make Rules concerning Captures on Land and Water, and as neither has yet been done, your Operations must accordingly be partial & limited. For the present, you will be governed by the following



*Courtesy of the Naval R.O.T.C. Unit of Tulane University
and Mr. Richard Foster, of New Orleans*

CHECKING BRITISH SEA POWER AT NEW ORLEANS

It was in the Battle of New Orleans that Lieutenant Carmick, U. S. Marine Corps, received the wound that occasioned his death.

Instructions, which relate to the Prevention of Violations of our jurisdictional Rights and to Self-defence.

1. The Jurisdiction of the United States, on our Coast, has been determined to extend One Marine League from our Shores, and to comprehend all our Rivers and Inlets, and all the Bays and Sounds, land-locked by the Territory of the United States. If within these Limits, you find any armed Vessel whatever, committing Depredations on our Coast or attacking or having taken, or in the act of pursuing to attack or take any Vessel of the United States, or the Vessel of any Nation whatever, you are to make every Exertion to prevent the Execution of such unlawful Proceedings, and to defend or liberate or retake the Vessel pursued, attacked or captured, and send in the offending Vessel, to some port of the United States, to be dealt with according to Law, in such cases.

2. If on the high Seas, you are attacked by any armed Vessel whatever, you are, to defend Yourself to the Utmost. If the Assailant strikes, examine her Papers, and if She has not a regular Commission, and then in force, bring her into some Port of the United States, to be tried as a Pirate.

3. You will consider your Cruising Ground, till further Orders, to be, between the Capes of Virginia and Long-Island, and will change your Course, from time to time, so as to afford the best Protection in your power to our jurisdictional Rights, and especially to all Vessels of the United States, in coming on or going off the Coast.

4. On the twelfth of June, you are if possible to be at the Capes of Delaware, between Cape Henlopen & Cape James, and there to wait for additional Orders from the President.

5. You will engage a Pilot if you think it necessary to remain with you during the Cruise, or 'till the 12th of June.

6. You will as often as Opportunities present, transmit a Journal of your Proceedings and such Events as it may be proper to communicate.

Two days later Captain Dale weighed anchor and sailed the *Ganges* away from Philadelphia to take up his assigned patrol station at sea; as before stated, the *Ganges* thereby gained the signal distinction of having been the very first vessel of the United States Navy to put to sea in that undeclared war.

Lieutenant Carmick remained attached

to the *Ganges* until late in the summer of that year, when he was ordered to be relieved by First Lieutenant Simon W. Geddes, U. S. Marine Corps. In the meantime Congress had passed the Act of July 11, creating the United States Marine Corps, the first Major Commandant to be appointed being William Ward Burrows. And among the first orders signed by Major Commandant Burrows after his appointment to that office were those of August 23, 1798, issued to Lieutenant Geddes to report aboard the *Ganges* as relief of Lieutenant Carmick:

Sir: You are to repair to Marcus Hook to relieve Lieut. Carmick and place yourself under the orders of the Captain or Commanding Officer of the Ship.

As all orders will immediately come from the Captain to you it is expected you will pay implicit obedience to your superior officers, as by your Example your soldiers will be taught to respect you and cheerfully obey you.

The Marines in all foreign services are excused from going aloft, so that you must attend particularly to this regulation and by no means allow them to be ordered aloft, but if they wish to go, you may permit but not force them.

You must notice all Deserters to me under Cover to the Secretary of the Navy and advertize them immediately at the nearest town.

Shortly following creation of the U. S. Marine Corps in the Summer of 1798, Lieutenant Carmick was regularly commissioned a captain in that branch. He later rendered distinguished service in our Naval war with France while commanding the Marine Guard on board the U. S. Frigate *Constitution*; he also performed outstanding service in both the war with the Mediterranean Barbary Powers and the War of 1812, being wounded in the latter conflict at the Battle of New Orleans, on December 28, 1814; he died in that city in November, 1816, as a result of his wounds, and was buried in Saint Louis Cemetery at New Orleans. He was born in Philadelphia in 1772.

Thus did Daniel Carmick, the U. S. Navy's first "seagoing" Marine Officer, write a glorious *semper fidelis* chapter in the early history of the United States Marine Corps.



Official U. S. Coast Guard Photograph

A GOOD PLACE TO USE RADAR AND VPR

A U. S. Coast Guard cutter in an Arctic bay. Mountains, icebergs, and every other mass will present reflecting surfaces for the questing rays of the navigator's electronic equipment.

SHORE NAVIGATION WITH RADAR AND VPR

By CAPTAIN WILLIAM HUGH ORGAN, *U. S. Navy*

URING the night of July 27, 1948, the U.S.S. *Marias*, a Naval Transportation Service tanker, steamed down the coast, enroute from Anchorage, Alaska, to San Francisco, California. Visibility was so poor that the shore rarely being in sight. Navigational aids were scarce. The channel ranged from a few hundred yards to several miles. Currents were variable both in direction and strength. The ship's gyro compass had a five degree westerly error. Visual bearings were taken as opportunity presented but these bearings were totally inadequate for navigational purposes. The fathometer was operating satisfactorily, but it yielded very little information as to the ship's position. In spite of all these adverse conditions, the ship's speed of sixteen knots was maintained with perfect safety.

In the above situation the commanding officer was using neither "potato" nor "pig dog" methods of piloting. He was not equipped with a crystal ball nor was he endowed with occult faculties. Actually he was navigating by radar and an associated device known as the VPR. The confidence placed in this equipment was based on the considerable experience with it.

The use of radar for navigational purposes has two general aspects, its offshore and its inshore use. In its offshore or open water employment the radar is essentially a ranging device and an aid in determining the position and movements of other craft and objects under low visibility conditions. In its inshore employment the radar serves not only the foregoing purposes but also provides information by means of which the ship can be safely piloted along the coast, clear of rocks and shoals and in and out of bays and harbors.

The land and bounding any body of water may be visualized as consisting of thousands of small areas, each capable of acting as a reflecting surface for the electromagnetic waves produced by a radar transmitter. The

intersection of the radar bearings and the locus of the radar ranges of all these tiny reflecting surfaces will be a single point which marks the position of the transmitter and thereby fixes the position of the ship. A radar fix thus obtained is in no way dependent upon artificial features ashore such as light-houses, beacons, structures, or electronic aids. By taking advantage of this characteristic of radar, which requires only the shore's natural topographic features for position determination, any bay, harbor, channel, or other restricted body of water, regardless of the presence or absence of the usual navigational aids on shore, is potentially navigable under all visibility conditions.

The navigator has the following methods at his disposal for determining the ship's position by means of radar: (a) he may strike range arcs from a number of known points on shore; (b) he may plot the ranges and bearings of one or more known points; (c) he may plot the radar bearings of two or more points; or, (d) he may match a chart of the area with the radar pattern on the scope.

In the first three methods (a, b, and c) or any combination of them, the navigator frequently finds it difficult and time-consuming to identify echoes. In contrast, by the last method (d) he can identify all echoes almost instantly. In addition to being a faster

A GRADUATE of the Naval Academy and of the Post Graduate course in Radio Engineering, Captain Organ performed Communication duties in the Asiatic Fleet from 1937 to 1940. His wartime assignments included Officer-in-Charge Radio Installation, Bureau of Ships; Navigator, U.S.S. *Honolulu*; Radio Officer CinCPac Staff; Executive Officer, U.S.S. *Indiana*. Subsequently he has served as Special Assistant to the Head of the Electronics Division, Bureau of Ships; Electronic Officer, Naval Shipyard, Long Beach; and Commanding Officer, U.S.S. *Marias*. At present he is assigned to the Office of the Chief of Naval Operations.

method of determining the ship's position, the chart matching method is inherently more accurate for, in effect, it makes use of an infinite number of reference points.

There are several methods of chart matching. One of the simplest is to use the Virtual PPI Reflectoscope, referred to as the VPR. The VPR is an optical device which fits over the PPI scope of a radar or radar repeater. Its principal elements are a set of reflecting mirrors, a chart holder, and a viewing hood. Looking in the viewing hood, the navigator sees the chart which he has placed on the chart holder and, superimposed on the chart, he sees the virtual image of the PPI scope, formed there by the reflecting mirrors. By moving the chart he can match the tracing of the shoreline with the virtual image of the PPI scope pattern.

VPR charts are constructed on blanks made of translucent plastic, coated with black wax. The wax coating may be cut easily by a tracing point, and, where cut, will pass light.

The VPR chart holder is a flat glass surface and has a rheostat controlled light beneath it. Varying the intensity of the light outlines the tracing in different degrees of brightness.

VPR chart preparation is simple. A tracing of the desired shore line is made on a wax coated blank, using any of the scales on which the radar operates. Tracing and scale reductions or enlargements are accomplished by means of a pantograph and a Hydrographic Office chart of the area. The tracing should not contain more detail than is necessary for matching and piloting purposes. Some of the more important elements to include are: a few major contour lines, mountain peaks, high bluffs, groups of buildings, low areas, ten fathom curve, shoal spots, buoys, lightships, obstructions, wrecks, etc. A few latitude and longitude lines add to the value of the chart tracing. The desired course entering or leaving port should be laid down on the H.O. chart and should be duplicated carefully on the VPR chart.

Although VPR chart preparation is simple it places an extra responsibility upon the commanding officer. He must ensure that the portions traced are accurate scale reproductions of the corresponding parts of the

H.O. charts. He must take particular care to see that underwater hazards are entered and placed accurately.

The operation of the VPR might be best illustrated by a hypothetical case. Assume that a VPR equipped ship is approaching San Francisco Bay at fifteen knots from the southwest. The weather is foggy. At sixty miles out her radar picks up a few land echoes. Her navigator cannot positively identify any of them but he suspects they are peaks lying to the north and to the south of San Francisco. Having prepared a VPR chart tracing for use on the eighty mile scale he places it in the chart holder of the VPR, which has been placed on the bridge radar repeater, turns on the light beneath the chart and looks through the viewing hood. Finding the tracing a little too bright, he dims the light. On this chart, which is a long range one, he has taken pains to enter the more prominent peaks and ranges. He moves the chart around, trying the peaks in various positions beneath the virtual image of the echoes until they appear to satisfy the configuration on the scope. He notes that the longitude lines on his chart, as he has oriented it, run approximately in a true north-south direction, tending to verify the correctness of his chart matching. He concludes that the position he has obtained is about three miles south of the approach track.

Next, he takes a range to a reference point on the VPR chart by means of the range circles on the scope, rotates the bearing cursor till it lines up with the same point, and reads the true bearing on the scope's gyro repeater. Using the range and bearing thus obtained, he plots the ship's position on the large scale H.O. chart in the chart house. Fifteen minutes later he again matches his VPR chart and this time notes that his position is about one mile south of the track. During the next hour he takes a number of positions with the VPR and transfers them to the large scale chart. Fairing his track through these points he finds that his mean track lies about two miles south of the approach track and about one degree to the left of it. Although this course deviation may be due either to a gyro error or to currents, he suspects the former, as

charts of the area indicate southerly currents of about half a knot. He recommends a temporary course change to the left to put the ship on the approach track. The change is made and base course resumed upon reaching the track.

The ship is now about forty miles out from the entrance and land echoes are becoming stronger and more extensive. The radar operator reports that he believes he has a ship on the port bow distant about eighteen miles. The navigator checks the repeater scope on the bridge and sees the same echo. However, with the VPR chart matched, the echo conforms to the position of South Farallon Island. This identification is confirmed by subsequent data.

The navigator now notes that in positioning his chart the longitude lines show a consistent offset of one or two degrees to the left of north. This appears to confirm the westerly gyro error suspected earlier. If there is no gyro error, and the chart has been correctly matched, the longitude lines will lie in a true north-south position. The navigator informs the captain of the gyro error and recommends steering a gyro course one degree to the right of the base course. The captain orders the change made.

When land echoes begin to appear on the twenty mile range scale, the navigator replaces his eighty mile VPR chart with one constructed for use on the twenty mile scale. The lightship is now plainly visible on the radar screen, and on its present course the ship will pass it about one half mile to port.

The captain comes over to the repeater to take a look at the PPI scope. The light beneath the chart is off and he sees only the virtual image of the pattern on the scope which appears to him as just a mass of echoes. He turns up the light beneath the chart and the tracing of the shore line becomes visible. As the chart had been matched a few minutes before the echoes from the land now become recognizable under the tracing. What had been a confusing pattern to him just a moment before, is now a well defined picture which gives him a clear idea of the ship's position with respect to the lightship and the shore. He sees some rather large but faint echoes not enclosed by any of the shore lines. He asks the navigator

about them, and the navigator replies that he believes they are side lobe returns. The navigator asks the operator to turn down the gain. With the gain turned down, the faint echoes disappear, which confirms the navigator's belief.

The radar operator again turns up his gain and reports two ship contacts, one at about eight miles standing out of San Francisco harbor and another dead ahead at about two miles. The latter contact he believes to be a small craft because of the weakness of the return and the range at which it was picked up. The navigator, checking the VPR, verifies them as probable ship contacts.

The captain orders speed reduced to five knots and maneuvers the ship up to the vicinity of the lightship and makes the signal for a pilot. A pilot vessel soon appears out of the fog and the pilot is taken aboard.

The navigator and the pilot concur on the course to be steered to the outer channel entrance buoy and the ship proceeds slowly through the fog along the designated course. The earlier ship contacts are reported by the navigator as no longer being potential dangers.

The navigator now replaces the twenty mile scale with a ten mile scale chart. He sees that side lobe returns are clouding the scope rather badly and has the operator turn down the gain. This makes it easier for him to match his chart. He advises the captain that the ship appears to be checking along the track.

The operator reports a new echo near Alcatraz Island. With the aid of the VPR the navigator observes that it is not a part of the shore line nor a fixed object. He tracks it and reports it to the captain as a large vessel standing out which probably would be passed in the vicinity of Golden Gate bridge. The captain, after discussion with the pilot, decides to stop and wait for the outbound ship to pass through the Gate and steady on its new course. The navigator tracks the ship through the Gate and reports that it is apparently headed for the outer channel and should pass clear to port at about three hundred yards. The captain gives the order to go ahead at five knots.

After passing under the bridge the navigator replaces the ten mile scale VPR chart

with a four mile scale chart. He concurs with the pilot on the course to the designated berth in the quarantine anchorage.

The captain advises the pilot he will anchor using radar bearings. He directs the navigator to furnish him the necessary information for anchoring.

The navigator plots the progress of the ship, using VPR data, and keeps the captain advised accordingly. When in position the captain anchors the ship.

The foregoing imaginary approach, while not exhausting the possibilities of the VPR as a navigating tool, does illustrate many of its most useful applications.

The advantages of VPR navigation may be summed up as follows:

- (1) It is simple. In essence it only requires of the operator the ability to superimpose one image upon another.
- (2) It is accurate. It meets all normal piloting demands for accuracy.
- (3) It is rapid. Matching chart and image takes only a few seconds.
- (4) It is clarifying. It instantly resolves the mass of echoes in the vicinity of land into easily identifiable areas. It also assists in identifying ships in the proximity of land.

(5) It is self-sufficient. It requires no artificial aids ashore.

(6) It has long range characteristics. Under certain conditions fairly accurate piloting is possible at distances in excess of sixty miles from land.

We appear today to be going through a period of change in our low visibility piloting methods. Electronic developments are making possible means of piloting which are rapid, accurate, and reliable. Just what trend these developments will take would be very difficult to predict. Developments resulting in a standardized system of world-wide electronic piloting aids would be very desirable. However, such a system would probably be very difficult to establish because of the necessity for all nations agreeing on a common system. Arriving at such an agreement would be a laborious task and one which would not be made any easier by the demands of competing industrial concerns within the countries themselves.

While awaiting this era of "push-button" piloting, the use of VPR in conjunction with radar is recommended as a very satisfactory interim method. With a radar, a VPR, and a set of charts, the navigable waters of the world are truly your oyster.



DON'T TURN A DEAF EAR

Contributed by MR. FRANCIS L. FUGATE

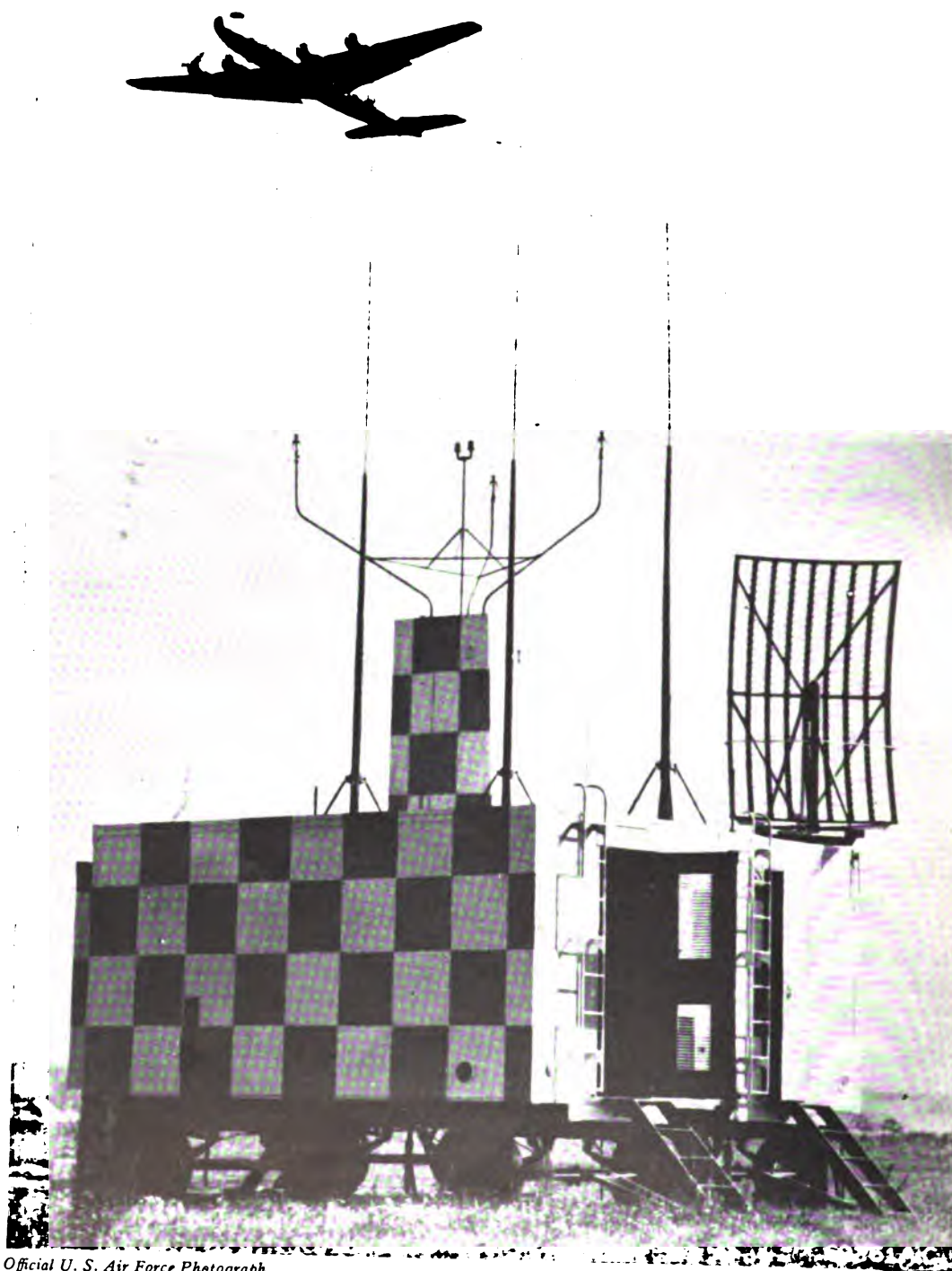
In San Diego the wife of a young Naval officer was the envy of the entire neighborhood—she had discovered an absolutely fool-proof defense against the time-consuming bother of door-to-door salesmen. She simply met them at the door with a pad of paper on which was printed: "DEAF—PLEASE WRITE."

Salesmen willing to write out their stories were few. Most bowed out gracefully to spend their time on more receptive prospects. However, one day a young man appeared who was perfectly willing to write:

"I am too!" he inscribed quickly. "And I had the same trouble you are having until I found the hearing aid I am now wearing and selling. A fellow salesman told me what a pity it is that such a charming young woman should be hard of hearing, and I know you will be more than satisfied with the results you can obtain from this new, revolutionary hearing aid. Please let me give you a demonstration."

These days the Naval officer's wife is listening patiently to all salesmen. Recently a "very slightly used" hearing aid was advertised in the local newspaper.

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS.)



Official U. S. Air Force Photograph

GCA KEPT THEM FLYING

An R5D makes its approach to the Templehof Airdrome over the Ground Controlled Approach unit whose radar operators brought in plane after plane during the fog, snow, and rain of the past Berlin winter.



Official U. S. Navy Photograph

NAVY AIRLIFT PERSONNEL HOLD ORPHANAGE CHRISTMAS PARTY

Transport Squadrons Six and Eight held a gala Christmas party for approximately seventy children in the Steinheim Orphanage near Frankfurt, Germany, over the 1948 holidays.

NAVY SQUADRONS IN THE BERLIN AIRLIFT

ALTHOUGH the triumph of "Operation Vittles" is generally known and appreciated, the small but positive part played by two Navy units, Air Transport Squadron Six and Air Transport Squadron Eight, has received little mention. It is the purpose of this month's pictorial section to bring attention to the meritorious work performed by those squadrons.

With headquarters in Honolulu and Guam respectively, VR-8 and VR-6 received orders at the end of October, 1948, to transfer to Rhein-Main, near Frankfurt, Germany, for participation in the Berlin airlift. Each squadron would fly twelve R5D Skymasters, the four-engined Douglas transports that both NATS and ATC had found the best transport plane of World War II.

Beginning operations in late November, the Navy squadrons soon proved that they could maintain the high standards that the

Air Force had already established. In fact, by mid-March VR-8 had led all other squadrons engaged in the airlift for the third consecutive month. Utilization had broken through the ten-hours-per-day mark. Long training in the use of GCA (Ground Controlled Approach) radar directed approaches in NATS paid off in the difficult Berlin winter weather. Trips through the Russian Zone were uneventful. Forty minutes out of Fulda, aircraft reported to Tempelhof for letdown and landing. Because maintenance of proper airspeed was so important in the tightly meshed schedule, Air Force control planes often flew formation with the airlift R5D's to insure proper calibration of airspeed indicators.

The experience gained by the 800 Naval Aviation personnel will be of continued value whenever all-out air transport support is required.



Official U. S. Navy Photograph

THE NAVY CARRIES ON IN THE BERLIN AIRLIFT

Transport Squadrons Six and Eight, each with twelve R5D aircraft, were transferred from the Pacific in November, 1948, to operate from the Rhein-Main Air Force Base near Frankfurt. Navy personnel immediately proved able to supplement creditably the excellent Air Force effort.



Official U. S. Navy Photograph

BEING BRIEFED ON THE RHEIN-MAIN TO BERLIN ROUTE

Navy participation in the Berlin Airlift demonstrated the ability of the services to work together *with a friendly rivalry* that brought out the best performance of each.



Official U. S. Air Force Photograph

WHERE ALL THE RECORDS WERE BROKEN

This is Tempelhof Airdrome, noted for its difficult approaches. Here the tremendous possibilities—and the tremendous costs—of military air transport were demonstrated in a way which brought credit to the United States in the eyes of all Europeans.



Official U. S. Air Force Photograph

MITTELEUROPA'S WINTER WEATHER GOT LICKED

The real test came after the Navy squadrons joined the airlift late in 1948, for Berlin is notorious for its miserable winter flying conditions. Excellent personnel and the finest equipment met these tests and actually made it possible to exceed quotas.



Official U. S. Air Force Photograph

NIGHT SCENE AT TEMPELHOF

Even at night, time on the ground for airlift transport planes was maintained on a seventeen-minute turn-around schedule as the record best. Twenty minutes on the ground was the ideal average.



Official U. S. Air Force Photograph

BUILDING A RUNWAY FOR VITTLES PLANES

Improved facilities of all kinds were required at Tempelhof. Shown above is a member of the 759th Engineers leveling the base for a new 5500 foot runway and quite oblivious of the RSD making its approach.



Official U. S. Air Force Photograph

A TWENTY-FIVE TON LOAD OF FLOUR FOR BERLIN

Air Force Operations proved that the C-74 Globemaster was more efficient than the C-54 (R5D) Skymaster, for which 21,000 lbs. was a normal load, although one Navy R5D took in a 26,730 lb. load on one occasion.



Official U. S. Air Force Photograph

UNLOADING THE GLOBEMASTER

In the same general size category as the Navy's *Constitution*, like it the Air Force's C-74 has demonstrated the advantage of the extra-large transport over routes equipped with runways which can stand up under the heavy loading necessitated.



Official U. S. Air Force Photograph

GERMAN LABORERS SPEED THE CARGO

Practically all the equipment employed in connection with the airlift was of American manufacture and operation. At all airports, however, it was possible to use German labor for many manual jobs. The number of Americans was kept at the practicable minimum.



Official U. S. Air Force Photograph

A TWO-WAY OPERATION—SOMETIMES

Usually the airlift planes had little or no cargo for the return flight. Once in a while the beleaguered city scraped together a few exports. Test your German on the special labels on these cases.



U. S. Air Force Photograph

LOADING AND UNLOADING SIMPLIFIED

potatoes, and coal lent themselves to rapid handling. The coal was both the easiest and the dirtiest; but for the cargo, emphasis was on speed and more speed all through the long, dark winter months when conditions were at their worst.



U. S. Air Force Photograph

ALL DEPENDED ON MAINTENANCE

A four-hour maintenance schedule, plus lots of personnel ingenuity, kept the airlift planes flying. Utilization of the C-47 broke through the ten-hour figure in March. It is worth noting how much lower is actual utilization than the figure used in many popular articles.



Official U. S. Air Force Photograph

THE RHEIN-MAIN BASE, FRANKFURT, GERMANY

The Swedish transport in the foreground demonstrates that commercial planes were able to maintain their normal schedules despite the day-and-night shuttle of American planes to "Berlin Island."



Official U. S. Air Force Photograph

WAITING TO LOAD BERLIN CARGO

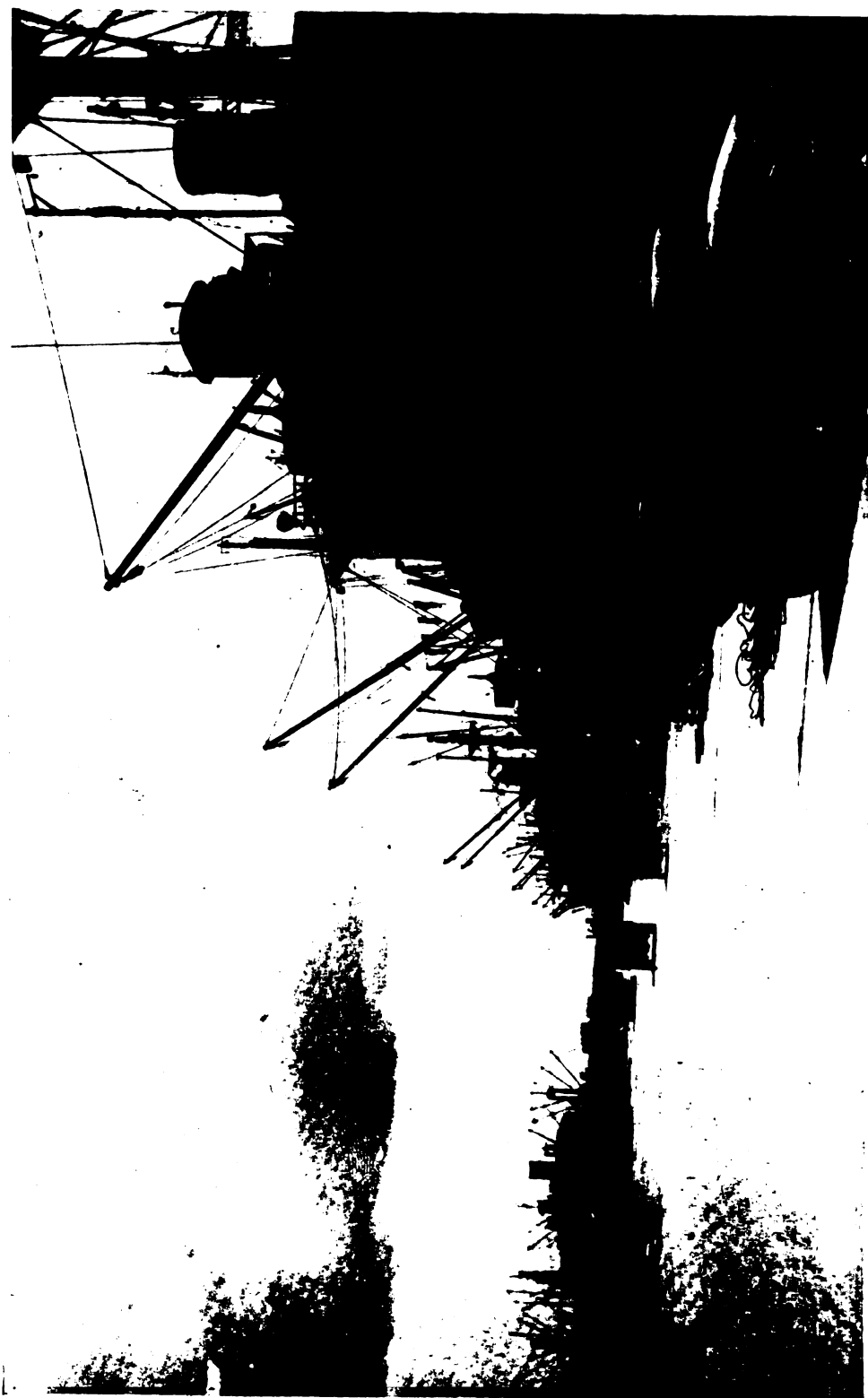
The radio tower, as a symbol of communications and airways control, and the mechanical ground equipment *were the two great aids* to enable the planes in the air to do their job. This scene is also at Rhein-Main.



Official U. S. Air Force Photograph

TEN TONS TO TEMPELHOF

A Navy Airman is shown checking his cargo of flour. He was one of the 175 officers and 644 enlisted men of VR-6 and VR-8 who were in Germany at the beginning of 1949.



Official U. S. Navy Photograph

"NON-COMBATANT BILLETS ARE JUST AS IMPORTANT AS THE COMBAT ONES"

Part of the great transport and supply line at Guam during the war. Logistics is just as important to victory as front-line fighting.



DISCUSSIONS COMMENTS NOTES

here Do We Go From Here?"

see page 47, January 1949 PROCEEDINGS)

MAIN J. M. KENNADAY, U.S.N.—In the article in the January issue Commander McCain proposes a program of "operational growth and experience . . . (which) . . . will give a certain number of officers this necessary and extensive background . . . (for the) . . . the command of combined operations." I think his idea of such specialized training for each officer's command or for a sort of general staff command in the Navy is excellent in its general concept. It is quite true that we apparently have assumed, up to now, that our leaders and their able staff assistants would just naturally develop if they followed the general prescribed rotation of duty. We have been pretty lucky in having them do so, thus making it a haphazard system. I do not see, however, that Commander McCain's program will, as he sums up, "give equal opportunity to all line officers irrespective of former training" because he states that "At this point (after eighteen years' service) those officers best qualified for command shall enter an indoctrination and training period of sufficient duration to thoroughly familiarize them with the tactics and uses of all the tools of modern naval warfare These officers are the Navy's specialists in strategy and tactics." (What about logistics? But that's for later.) It seems to me that this is not after eighteen years most decidedly an end to "equal opportunity." Equal opportunity, by this plan, exists up to ten years' service but not after. In Commander McCain's selection of his officers on the basis of the first eighteen years of service.

I don't deny the desirability of such a plan, even so. But I am sure I am right in saying that the thinking of the officers' corps is not geared to such a concept at present. We all naturally want to be admirals, not merely for the prestige and pay but because to become so signifies success and prowess in our profession. If we did not want to be admirals, we should not be sufficiently ambitious. All line officers want to command destroyer squadrons or large combatant ships not merely because such commands are (or may have been) prescribed stepping-stones to flag rank—"something on your record"—but because we consider them (as Commander McCain does, too) necessary experiences for future higher commanders. If after eighteen years only, these experiences are cut off, these ambitions dashed, what will be the effect upon the attitude of those *not* selected to be the "leaders of tomorrow"?

Well, I think there is a solution, although it may be slow in coming. We all realize that modern war requires more "men behind the man behind the gun" than ever before. Logistics and services were tremendously important in the late war and they will be even more so in any future conflict. Commander McCain has treated them rather lightly in his article, I feel, although the PROCEEDINGS, with one of the illustrations for it, pointed them up for him! We must come to the realization that only a few of us need to be—can be, in fact—in the combatant billets.

But there's a catch to that, too. The non-combatant billets are just as important as the combatant ones. An officer who knows has written, "There is no duty in the Navy that makes greater demands upon the ability, character and physique of an officer"

than command of an advanced base in wartime. Such a commander, he adds, should have the same attributes as those required for the commander of a large combatant unit. There is high command in the services and in logistics as well as in strategy and tactics.

The fact that there is should broaden the field somewhat, at least. Because of the great numbers required in the support organization, it should broaden it a good deal and spread out considerably the opportunity for a useful and progressive future after eighteen years.

Even if that is so, however, a change in thinking is required. We still have the tendency to feel that the logistics man won't thoroughly understand and appreciate the problems of the combatant—or any—ship unless he too has been in the ship end of the game, and as high up in that end as command. I admit to an instinctive feeling in that direction myself, but I believe, on sober consideration of the record, that our EDO's, supply officers, and civil engineers have proved the fallacy of such a feeling. The Army's experience with its services also supports this. I know, however, that many officers do not agree with me on this point.

I believe, though, that the Navy will have to specialize more and more, and that we must get out of the old prejudice that specialists will not work whole-heartedly for the support of the Fleet. There are two good reasons for this specialization. One is that large ship commands are just too scarce and that the present short tours of command are good neither for the captains nor the crews. The other is that we are simply not developing in sufficient numbers the specialists in logistics that we need.

I used to wonder how graduates of the Naval Academy who had also served in the Fleet could ever put themselves in the position (by becoming constructors—now EDO's) of never being able to command a ship. I understand their feeling now, and I respect them for it. But it will take time and education and tangible inducements to bring the Navy around to a system of specialist services anywhere near approaching that of the Army.

The Post-War Chief Petty Officer

(See page 1481, December 1948 PROCEEDINGS)

CAPTAIN JOHN H. SCHULTZ, U. S. NAVY.—“Too many Chiefs and too few Indians” has presented a serious problem in the post-war Navy. An explanation of how this came to pass may be helpful in understanding and weathering the predicament until it eases.

After World War I there was an excess of chief petty officers. A partial solution was to effect early transfers to the Fleet Reserve; i.e., men of eighteen or more years service were permitted to transfer with the benefits of twenty years service; and men who would be eligible for transfer after sixteen years service at the expiration of their current enlistments (which in some cases meant a mere twelve years service) were permitted to transfer with the benefits of sixteen years service. (20 years are required now except for men who were in the service prior to July 1, 1925, to whom the 16 year rule still applies.) The top-heavy situation gradually worked itself out.

The same difficulty was foreseen during World War II, and the Bureau of Naval Personnel took steps to prevent a recurrence. ALNAV-110 of June 16, 1944 prescribed that on and after July 1, 1944 (until further notice) all advancements in rating to pay grade 4 (3rd class petty officer) and above would be *temporary* and that rates would be so designated (T).

The plan was to revert personnel to desired proportions at the conclusion of hostilities.

When the war ended, Reservists were separated expeditiously. Strenuous efforts had to be made to get *regular* Army and Navy replacements. Short enlistments and other inducements were offered.

Public Law 190, 79th Congress “Armed Forces Voluntary Recruitment Act of 1945,” was enacted October 6, 1945. Section 5 provided “that any person enlisted or reenlisted prior to February 1, 1946, in the Regular Military or Navy Establishment within twenty days after discharge from such establishment shall be enlisted or reenlisted in a grade or rating at least as high as the high-

de or rating, permanent or temporary, by him at the time of such discharge."

the passage of this act the Navy had effecting first enlistments (of former) and reenlistments in their *per-* grades and immediately advancing to the temporary rate (T) held upon rge.

m the above it will be seen that reen-nts and enlistments contracted during nure of Public Law 190 had to be nent, i.e., shipped permanently in the t grade, temporary or permanent. In words, a permanent second class petty who was a temporary Chief Petty upon discharge would be permanent Petty Officer. Commencing February 6 men could be reenlisted or enlisted les as the Navy saw fit. Personnel who in under the act were at a decided ad-ge, since others who were *temporary* be reverted to as low as their per- grades but permanent grades could : reduced except by court martial, by (for advancements effected by the anding Officer of the same ship or), or by low quarterly marks and s action (pay grade one appoint-).

led to a situation wherein there was y to establish a reversion policy that be fair to all hands. Accordingly it ecided that if *some* were to be per- it, the equitable course was to make dy permanent. ALNAV 39-46 of Jan- 21, 1946 stated that "on February 1, emporary advancements in rating, in- g changes of status to pay grade 1, d subsequent to June 30, 1944 shall be ered permanent, and all advance- in rating, and changes in status to ade 1 effected subsequent to January 46 shall be permanent." The Navy i the same condition as after World , previous planning having been of no

ough the number of chief petty of-

ficers is decreasing, the appropriated strength of the Navy is dropping more rapidly and the chief petty officer percentage is increas- ing. Many of the chiefs are young, due to quick advancement during the war: they have a long way to go for 20 years and the Fleet Reserve. Also, they reenlist. A bal- anced rating structure is not in immediate prospect.

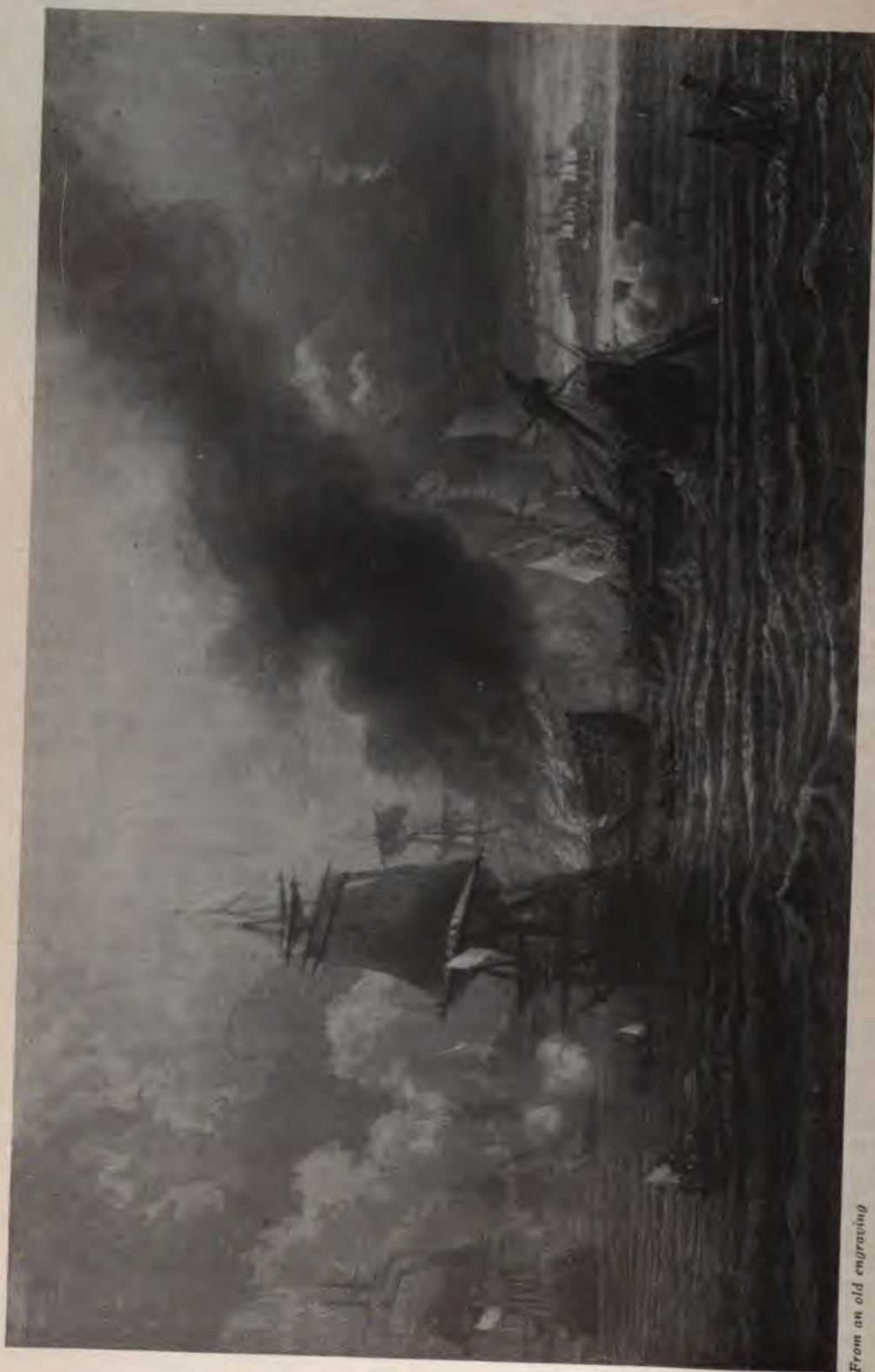
"Situational testing" has been proposed. Personnel would be examined to determine their degrees of qualification for their rat- ings. It is believed that should this be carried to reduction in rating to achieve balance, the morale of the Navy would unduly suf- fer; staying top-heavy is the lesser of the two evils. However, reduction in rating for incompetency is the duty of a commanding officer, and he has the means at his disposal (Art. C-7211, BuPers Manual 1948).

In the interest of morale, *deserving* ad- vancements are being made, even in the crowded rating groups. Recent competitive examinations found a surprisingly low per- centage that passed. Perhaps the tests were difficult, but indications are that further application and experience are required to produce the well-rounded petty officers the Navy enjoyed in the 1930's.

The most useful employment of chiefs is under constant study. In as many billets as possible no specific rating group is specified, merely the pay grade to allow leeway in assigning personnel, particularly those in the rates that are oversubscribed.

Since it is impracticable to improve our position at once, we must make the best of it. Chief petty officers have to accept the fact that a large number of them would not be chiefs if planned apportionment had not been hampered. Juniors simply have to take off their coats and turn to with other workers while the seniors supervise. *Rather than im- pair the prestige of chief petty officers, a clear understanding of the situation can be made to enhance it and to react to the benefit of the entire Navy.*





From an old engraving

BATTLE BETWEEN THE *NEVIS* AND THE *REDONDE*, 1667

This action is typical of the tremendous influence of sea power in the growth of Great Britain. From the days of Cromwell until our present generation, British sea power was almost the invincible tool in Britain's triumphs.



BOOK DEPARTMENT

regular and associate members of the Institute may save by ordering books through the Book Department. A discount of 10% is allowed on books of the Naval Institute and of other publishers (except on foreign and nautical publications, and on books on which publishers do not give a discount). Allow reasonable time for orders and books to be delivered directly to you by publishers. Address Secretary-Treasurer, U. S. Naval Institute, Annapolis, Maryland.

INFLUENCE OF SEA POWER ON THE HISTORY OF THE BRITISH EMPIRE. By Admiral Sir W. M. James. Cambridge: Cambridge University Press, 1967. 67 pages. \$1.50.

EDITED BY COMMODORE DUDLEY W. KNOX, U. S. NAVY (Retired)

This little book of 67 pages is a brief examination of Britain's critical need of sea power in spite of atomic weapons or any other technological revolution in warfare. It is written primarily for the British people, but will be equally of interest to Americans and useful for professional readers in both countries. Its theme is developed from sea history.

Throughout history four elements have made it possible for Britain to control the sea: the power to control the sea—merchant ships, bases, weapons and men." Especially in the fourth element—personnel—leadership and fighting—there is no doubt that the British have nearly always had a superiority. This pattern is the main theme developed from a historical outline of sea power afloat, from early times to and including the recent hostilities. Great stress is laid upon Britain's vital dependence on sea communications. The atom has not altered this and its effectiveness against ocean trade routes is very limited.

One of the three chapters comprising the book is devoted to the military character of the immortal Nelson, sketching

principally his early career as a classic illustration of the personnel element. This study is professionally illuminating on all levels of naval command. One striking contrast with Nelson was that of an old-time officer "who never thinks beforehand and is therefore under the confusion of a surprise when anything happens, always in such a hurry when he takes in hand to do anything that he never does it; puzzling himself and all about in little detailed minutiae whilst essentials are never thought of."

On the other hand Nelson's "sayings and doings are a durable monument, in very truth" even as a young officer.

Utilization of history as a guide to present conduct and future plans is a field in which British students and authorities have long excelled—to their profit. We would do well to emulate them in national as well as naval affairs. Our Navy in wartime feverishly analyzes its current experiences and gives the lessons quick application. Thus we then exploit history, however recent, with ardor and to great advantage. But with peace upon us we are much too prone to let our war records, with their invaluable lessons, accumulate the dust, and to relegate history to the realm of quasi-romance. It is too potent an instrument of professional education and training on all levels of command to warrant such neglect.

THE ARMY AIR FORCES IN WORLD WAR II, Volume I. Edited by Wesley

Frank Craven and James Lea Cate.
Chicago: The University of Chicago Press,
1948. 788 pages, illustrated. \$5.00.

REVIEWED BY LIEUTENANT ROY L. KLINE,
U. S. MARINE CORPS

This is the first volume of a projected seven volume history of the Army Air Forces in World War II. The need for a history seemed especially urgent in the case of the Army Air Forces, the youngest, by far, of the military arms. With this need in mind the editors, both of whom are historians and were members of the AAF Historical Office during the war, have attempted to provide the public with a final report on the activities of the AAF in World War II.

Volume I is divided into four major sections. Section I, "The Early Heritage," covers the Air Service in World War I and, in greater detail, the Army air arm between the two wars. Here readers will find a rather detailed report of the organization of the Army air arm 1919-39, the development of air doctrines and the accompanying evolution of the heavy bomber. General William Mitchell's role as "the founder of American air power" is described and should be of particular interest to members of the naval service. "Because of the traditional importance of sea power in the national scheme of defense" the authors write, "Mitchell's boldest attacks against the existing order were directed against the Navy. In that service, even more strenuously than in the Army, conservatives had resisted the development of the air arm. Mitchell ascribed that resistance to occupational jealousy of men who feared the intrusion of a new weapon which might upset the theories of Mahan."

Writing about Mitchell's efforts the authors state that, "he was capable of slanting an argument or of making claims for air power hardly justified by the performance of aircraft then available." (Recent editorials on this subject indicate that the prediction of one newspaperman that "'Mitchellism' will remain after Colonel Mitchell has gone" was extremely sound.)

Section II, "Prelude to War," reviews the air forces of the major powers of the period 1939-41. Of the German Air Force the authors state that Goering successfully op-

posed the Navy's desire for its own separate air arm. (The result of this separation of German aviation from the other services, especially the German Navy, although not evident from this history, is well known. The German Navy, denied aviation of its own, had no aviation upon which it could rely.)

The Air Corps' preparation for war and its development at the beginning of hostilities lead into the story of the attacks on Pearl Harbor and the Philippines. Here the historians limit their narration to the general pattern of events on Oahu and Luzon while recounting the events of that hectic period. The controversial questions of why Formosa was not bombed and why the B-17's were caught on the ground at Clark Field are left to the reader to answer after the historians have related the known facts and conflicting statements of personnel involved.

This Section concludes with a chapter on the "Establishment of the Fundamental Bases of Strategy." The book describes the ARCADIA Conference of 22 December 1941 between President Roosevelt and Prime Minister Churchill and the overall strategy which resulted. The reorganization of the War Department in March 1942 and the resulting statement of the Army Air Forces mission reveal again the long-standing dispute between the ground officer dominated General Staff and the AAF. J. L. Cate who authored this chapter states: "Thus in practice the Army Air Forces and its commanding general came to assume a role far more important than that prescribed in the reorganization of 9 March 1942. AAF officers were schooled to avoid the term 'independent air force' but in most important respects the AAF enjoyed tacitly a quasi-equality with the Army and Navy rather than the parity with the AGF and ASF which was its legal status . . ."

Section III covers tactical demands on the AAF, analyzing the requirements from the standpoint of concentration versus the dispersal of forces. The Coral Sea action and the Battle of Midway are retold. The latter story is complete from an AAF standpoint only. The assessment of their achievement appears to be the result of an honest analysis of their own participation in the battle. Here the historian states: "The impact of Midway

the concept of the Pacific air war held by the Navy and the AAF was considerable, giving off a train of debate which continued after the sea battle had ended. In the light of Japanese evidence and because of the limited number of B-17's involved, it can be little question that AAF contribution was insufficient to check the Japanese advance. Torpedo planes of both sides had suffered costly losses, and the bomber had won the day" (Readers who are interested will do well to supplement their knowledge of air power in this newly important Pacific battle by reading the United States Marine Corps historiography, "Marines at Midway" and the reports of the U. S. Strategic Bombing Sur-

though the story of the AAF in the light of the Atlantic is incomplete and will be continued in Volume II, the author, Major B. Ferguson of Duke University, has no doubt in the mind of the reader as to the magnitude of the anti-submarine job facing this nation in 1942. Problems of reliability, cooperation and operational skill in this essentially naval task were at almost as serious as the submarine menace itself.

The final Section covers plans, policies, organization and the establishment of the Eighth Air Force in the United Kingdom.

The AAF faced its real tests. Volume I concludes with the story of the attack on the shipping yards of ROUEN-SOTTE-VALE, 17 August 1942, the first attack by American "heavies" on German targets.

The complexity of the task of preparing a survey of this magnitude is apparent. Common to the over-all method of handling the subject is withheld pending availability of more volumes. The indication that some of the subjects will "be continued" in later volumes is somewhat disconcerting. There is little doubt as to the thoroughness of the effort involved in the preparation of this volume of the AAF history. The authors admit that mistakes were made even while winning victories.

The air power theme which prevails throughout the book is natural. A history of strategy without reference to sea power and air would be considered somewhat de-

ficient, to say the least. However, it will be interesting to read the historians' conclusions and implications in later volumes after recounting the total air-war effort. It is here that readers may take exception to the strategic bombing aspect of air power in much the same way as Major General J. F. C. Fuller has in his latest book "The Second World War—A Strategical and Tactical History." The official Reports of the U. S. Bombing Survey offer Air Force historians considerable material for analysis and comment. The results should be interesting.

The free and easy, undramatic style of Volume I does much to minimize the 788 pages of the history. An above average index and thorough notes contribute to the value of the document for future use, while the 31 maps and charts added to the 62 photographs complete a very large contribution to the history of the armed forces in World War II.

THREE THOUSAND YEARS OF ESPIONAGE. Edited by Kurt Singer, New York. Prentice-Hall, Inc., 1948. 384 pages. \$3.00.

REVIEWED BY ASSOCIATE PROFESSOR E. B. POTTER, U. S. NAVAL ACADEMY

Kurt Singer now follows up his earlier *Spies and Traitors of World War II* with an anthology of 38 spy stories covering the long range of history from Joshua of the Biblical narrative to the contemporary Beria, head of the Soviet NKVD. He has drawn on the writings of deservedly obscure writers and of such literary worthies as Herodotus, Pepys, Stefan Zweig, and Carl Van Doren. *Three Thousand Years of Espionage* appears, by its choice of material, to be directed at the casual reader in search of easy entertainment. And entertaining it is, for while the writing varies from crude to highly polished, the stories never lack in interest. All the well-known paraphernalia of the spy story are here: the corrupting of officials, the chase, the capture, the torture chamber, the hairbreadth escape, and the flight by night. Included also, as one might expect, are the titillating imbroglios of slinky female agents, including, of course, the inevitable Mata Hari, who achieved more for Hollywood and

the Sunday supplements than she did for her spymasters.

It would appear that the new book is destined to make a quick sale, earn an easy dollar, and rapidly be forgotten. And yet there are certain selections in the volume which deserve a better fate. Most worthwhile are the narratives concerning Napoleon's spymasters Fouché and Schulmeister, Bismarck's Stieber, Hitler's Canaris, and Stalin's Beria, and the concluding article on Soviet global espionage by Spencer Irwin. Through these, and lesser selections which accompany them, one perceives the development from the old hit-or-miss, highly individualistic espionage methods of the past to the more recent science of spying based on complex organizations, thorough, unrelenting, all-pervasive, and generally ruthless. The thoughtful reader will find such articles instructive. More important, government officials might find them a warning against the American tendency to neglect agencies of intelligence and counter-intelligence in time of peace. In the words of Irwin: "With victory over the enemy such agencies as the Office of Strategic Services, the Army G-2 and naval intelligence were allowed to disintegrate. An official feeling of security—wholly false—overcame us. This error must be remedied without delay. Experienced men must be called back and new operatives trained to carry on in peace time the work they did so tellingly in war."

JANE'S ALL THE WORLD'S AIRCRAFT 1948. Thirty-sixth edition. Compiled and Edited by Leonard Bridgman. New York: The Macmillan Company. \$20.00.

REVIEWED BY ASSOCIATE PROFESSOR ELLERY H. CLARK, JR., U. S. NAVAL ACADEMY

In comparison with the 1947 edition the current issue has been improved noticeably by the introduction of certain features. Specifically, there is a timely eight-page supplement of last-minute descriptive releases and photographs. Also, the aero-engine section is introduced by a comprehensive and significant article. Finally, there are indexes appended to the aeroplane and engine chapters.

Nevertheless, editor Bridgman maintains continuity with change. The basic pattern of

organization and presentation is as usual; first, the World's Air Forces, next Civil Aviation, and then Military and Civil Aeroplanes followed by Aero-engines.

This edition is slightly larger than 1947's by some forty pages and there is an increase of eighty photographs. Almost three-quarters of the issue is devoted to planes and engines of the British Commonwealth and the United States.

Air Commodore Banks has contributed an authoritative essay on aero-engines. In this he predicts that within ten years the gas turbine in its various forms will relegate the piston engine to a position of secondary importance. Commodore Banks also reviews the history of piston engines in World War II and observes that the Japanese "showed quite an extraordinary and unexpected ability in the development of their aviation engines."

Editor Bridgman in his preface briefly remarks that "Russia remains an enigma" and emphasizes the fact that "Great Britain's maintenance of the lead in gas turbines, both of the pure jet and airscrew types, is widely recognized."

The percentage of new illustrations is quite high, about 83 per cent for aeroplanes and 50 per cent for aero-engines. Among the many excellent photographs are those of the recent world-girdling, non-stop Boeing B-50, also splendid views of the Armstrong Whitworth experimental tail-less jet monoplane, North American KF-86 fighter, and Northrop YB-49 bomber. Consolidated-Vultee's remarkable experimental flying automobile is described and illustrated.

In conclusion, the presentation of reference material within *All the World's Aircraft* by a skillful blend of progressive development and established continuity contributes to the reading pleasure of those interested in military and civil aviation.

RADAR.—What Radar Is and How It Works.—Revised Edition. By Orrin E. Dunlap, Jr. New York: Harper and Brothers, 1948. 268 pages. \$3.00.

REVIEWED BY CAPTAIN JOHN L. MELGAARD, U. S. NAVY

The revised edition of Orrin E. Dunlap's

a story of radar; its past, present and future. The title does not do full justice to the contents, as it contains considerably more than a definition of radar and an explanation of how it works. That portion of the book is done in simple non-technical language easily understandable by all. Many questions which might arise in the mind of the reader are answered by a series of questions and answers. In addition, a table of suggested readings is included, as well as a list of definitions of radar terms.

The wartime history of radar and its value is set out in a number of sketches covering surface ship action, long range bombing, the Battle of Britain, the anti-submarine war in the Atlantic, the anti-radar devices, and defense against the 'buzz bombs.'

The story of the development of radar in the United States is covered from the early ground work of Hertz, Tesla, Marconi, and others, through the 1922 Naval Research Laboratory experiments under Drs. S. D. H. Young and the Army Signal Corps developments, to the entry of commercial electronics research and manufacturing companies such as Radio Corporation of America, General Electric, Bell Telephone,

and many others. The wartime exchange of information with the British through the Tizard committee in 1940, which was followed by our acquisition of the magnetron, and the exchange of scientists between the two countries gives an insight into the complete cooperation which prevailed. The story of the Radiation Laboratory at Massachusetts Institute of Technology established by the NDRC under Dr. Vannevar Bush is told. And finally, the role of American industry in the development, and more particularly in the production, of the radars and associated devices is covered in some detail, full and deserved credit being given to the electronics industry.

A chapter on radar in peace discusses present and future uses of radar and associated devices on land, sea, and in the air; for navigation, weather forecasting, terrain mapping, ore detection, and as an aid for the blind. In addition, it covers wartime uses such as guided missile control and fire control.

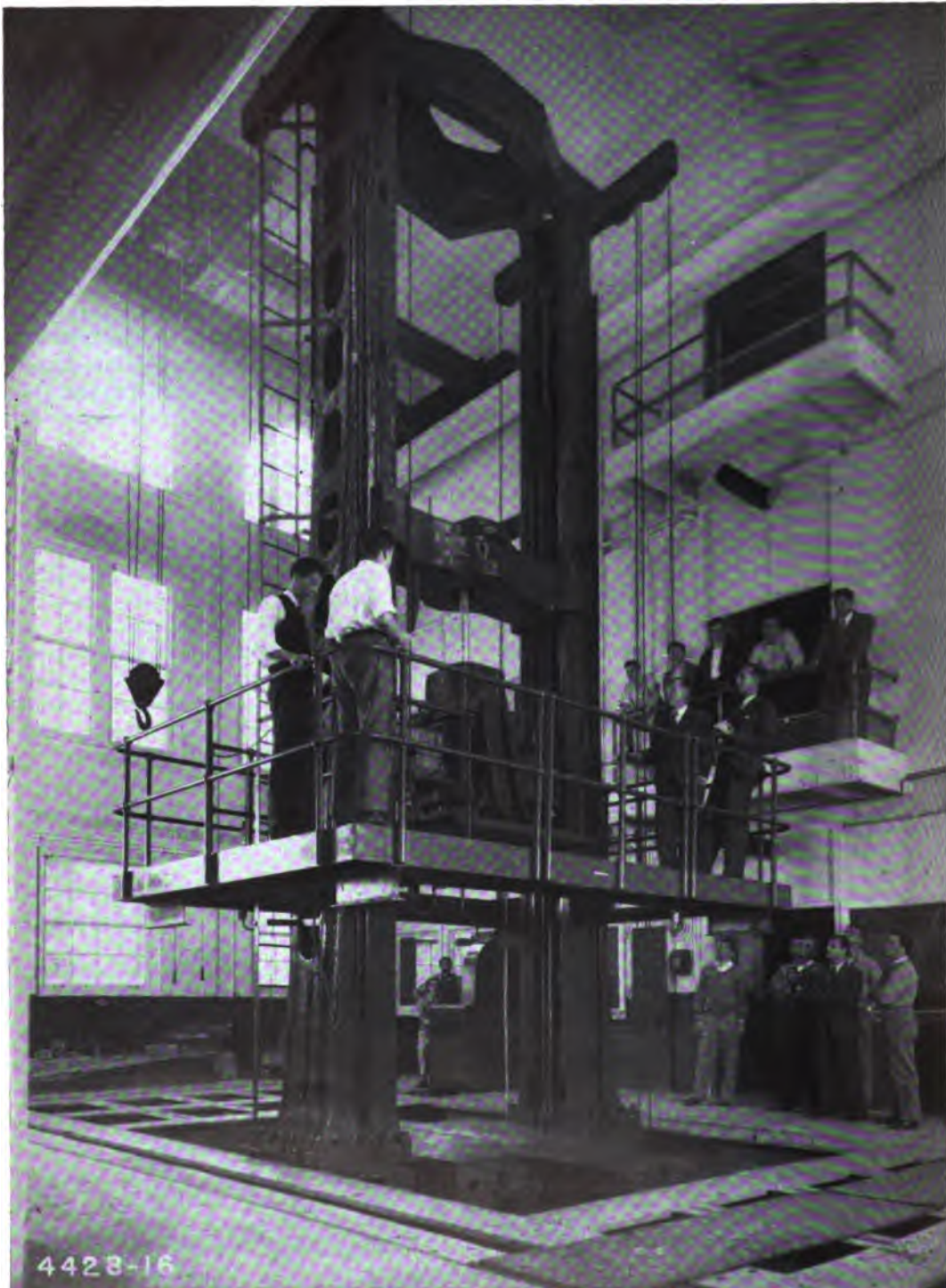
This is a well written and informative book. The emphasis laid on the value of war and peace time cooperation between the military establishment, civilian science, and civilian industry, adds to its value.



S. Navy Photograph

RADAR AND RADIO ON A CARRIER

Here are shown the twenty-six different radar-radio antenna installations on the U.S.S. *Lexington* four years ago.



Courtesy Baldwin Locomotive Works

INDUSTRY REQUIRES MAN-POWER

A 600,000 pound capacity universal testing machine of the Baldwin Locomotive Works. Man-power limits of the United States were severely strained in the last war. In a future war even our great man-power would be short of the enormous demands.



THROUGH JUNE 17, 1949

UNITED STATES.....	952
Heroic Gunner's Mate—Test Air Defense—U. S. Joins European Maneuvers—Caribbean Missile Range—Manpower Shortage	
GREAT BRITAIN.....	954
Modernize CV's— <i>Amethyst</i> Story— <i>Amethyst</i> Held—"Jet" Gunboat Test Cruise	
USSR.....	958
Far East Transportation System	
AVIATION.....	958
Aircraft for Armored Units—"Zero Reader" Flight Instrument— Electronics in Airpower—First British Jet Bomber—Russian Fighter Crashes in Sweden—French Transport	
MERCHANT MARINE.....	964
Shipbuilding Yards—Subsidies	
SCIENCE.....	965
Atom Bomb Guesses—Improved Lifejacket	
INTERNATIONAL.....	966
West Europe Maneuvers—Weather-Ships Relocated—Crisis Brews in Orient	

UNITED STATES

Heroic Gunner's Mate Protects Crew

N. Y. *Times*, June 4.—Seattle.—A chief gunner's mate hurled a blazing 20 MM. shell magazine overboard from the Navy destroyer *Maddox* yesterday, preventing serious damage to his vessel and possibly saving the lives of several of her Naval Reserve crew.

The *Maddox* and her sister ship, the *Moore*, were holding target practice off Cape Flattery when a 20 MM. shell primer exploded aboard the *Maddox*. The magazine, set afire by the blast, was wrenched loose and thrown into the sea by Chief Gunner's Mate Sammie T. Neel of San Diego.

D. A. Hanson, 21-year-old Naval Reserve seaman from Portland, was struck in the leg by the exploding primer. The *Maddox* returned under forced draft to Seattle. There Seaman Hanson was taken to the Bremerton Naval Hospital.

A piece of casing pierced his leg just above the knee. His condition was satisfactory today.

Chief Gunner's Mate Neel, 33-year-old veteran of nine years' Navy service, insisted today his action was not heroic.

"I just did what it says to do in the book," he said. "I was on the other side of the tub. I turned around and saw the magazine was afire. Next thing I knew, I was running across the deck. The kid was sitting on the ready box clutching his leg. I saw the blood running through his fingers. That's the first time a man's ever been hurt on my gun."

Chief Gunner's Mate Neel said he had nothing to grab the magazine with "except my bare hands."

"I started thinking about the rest of the ammo and that's when my knees started shaking," he asserted. "Finally, I banged it loose with the heel of my palm and tossed it over the side. Lucky I didn't get anything except a few small burns."

Testing Our Air Defenses

N. Y. *Herald Tribune*, May 30.—Bombers, fighter planes and radar services have been joined for the last three weeks in tests around the country in "Operation Black-jack," seeking to determine effectiveness of

the nation's defenses against air attack, it was revealed here today.

The operation is being directed by Major General Gordon P. Saville, commanding the Air Defense Command, with headquarters at Mitchell Field. General Saville earlier this year told a House of Representatives subcommittee, in successfully seeking legislation for a radar screen around North America, that the then existing warning system had been "almost a blank."

In the current tests, Strategic Air Command heavy bombers—B-29s and B-50s, anywhere from single planes to a group of twelve or fifteen—start a flight without advance notice. They may make an eight-hour strike through the territory of various fighter groups in the Air Defense Command.

They may work out to sea, and then start inland, and it's up to radar personnel to detect them. Then pursuit planes—like the 52d All-Weather Fighter Group's F-80 and F-84 jet craft and the twin-engine F-82s here—must see how fast they can take off and get up to intercept the simulated attackers.

There's no firing in the tests, but all sides work out the theoretical casualties or effectiveness. Then the bombers may ride on up to Boston, probing efficiency of fighters from Otis Field, on Cape Cod; to Portland, Me., where Dow Field should intercept them, and so perhaps turn on another leg to Detroit, where jet fighters from Selfridge Field should be on the job. It's a politely drawn-out course no war-time attack is ever likely to follow.

Success of the tests so far has not been announced. But it was reported here they would go on for a considerable period, and would be the first of a series covering a five-year expansion and development of the defense warning system.

Army and Air Force Join West Europe Combined Maneuvers

N. Y. *Times*, June 9.—Despite the fact that the United States Senate has not yet ratified the North Atlantic pact, it is planned that United States Air Force units and a small detachment of United States Army ground forces will join with France, Britain and the Benelux countries (Belgium, the Netherlands and Luxembourg), in joint

maneuvers during the latter part of the year.

Maneuvers are to take place in the Valley between Coblenz and Metz. Ground and air forces, stationed both in Germany and in the French occupation zone, will participate.

Ground and air forces from the United States on the zone in Germany as well as detachments from the United Kingdom will take part. Units from Belgium, the Netherlands and Luxembourg will participate. They will remain within the geographical limits of the Benelux coalition.

United States Air Force units from Germany will represent the main aerial component in the simulated operations. Furthermore, it was stated by highest French military sources that at least one battalion of German constabulary from the United States zone in Germany is expected to take part.

These maneuvers represent not only the first complete test of joint maneuvers on a joint basis by the United States and the Western

Union powers—those that signed the Brussels Pact—but also the first large-scale international maneuvers in Europe in which the United States is taking part since the end of World War II.

The United States Air Force joined the British Royal Air Force in limited maneuvers in the United Kingdom.

The September maneuvers are the first large-scale coordinated tests of the efficacy of Western Union defense forces. They will include both ground and air maneuvers by the British and the Americans beginning at the end of June, and in which some United States units are taking part. The naval movements staged at that time between the Bay of Biscay and the English Channel.

The purpose of the September maneuvers, which will be the first test of preparations on the part of the Western Union, Field Marshal Viscount Montgomery's Western Union headquarters in Brussels have been working, will be to test the efficiency of Western Europe's defenses against an air and ground attack from Germany.

The "enemy" offensive will start from the West bank of the Rhine near Coblenz and attempt penetration of Luxembourg and into northern France, aiming eventually

at Metz, which is one of the traditional defensive bastions of this country, then coming down the vineyard-bordered course of the Moselle Valley.

HOLDING OPERATIONS

This will be met not only by holding operations but by the threat of a counterattack from bases in the battered Maginot Line east of Metz.

It is hoped by the French that their brand new twelve-ton tank, now in production, will be ready to play its role in these operations.

This tank is French-designed and French-built. It mounts a 75-mm. gun of exceptionally high muzzle velocity and penetrating power. It is fast and unusually low so that it will be able to benefit by maximum of camouflage merely from fields of growing wheat.

In military circles here, there is unusual interest in the forthcoming September maneuvers for several reasons:

1. They will be the first test of plans drawn up by Western Union headquarters at Fontainebleau.

2. They will be the first test of the coordinating ability in practice of the defense forces of five countries.

3. They will be the first test of the striking power of the United States Air Force in Germany, which has been built up during the period of the Berlin airlift.

4. They will be an indication of the ability of the United States forces in Germany, which are not bound by the Western Union pact, to coordinate and cooperate in the plans in whose drawing up the Americans had no part.

Montgomery will be present during the maneuvers, which will be actually supervised by the French commander of the Western Union ground forces, Gen. Jean de Lattre de Tassigny, and by the chief of the French General Staff, Lieut. Gen. Georges Revers.

More Data on Caribbean Missile Range

N. Y. *Times*, June 2.—Great Britain and the Bahamas government have agreed to let the United States build radar tracking stations in the islands as part of its Florida-

based 3,000-mile test range for guided missiles, it was announced today.

The defense department confirmed in a "fact sheet" on the project, which eventually will cost \$200,000,000, that its launching site would be at Banana River, Fla., and, that the range itself would extend "to the southeast over the Atlantic Ocean."

The statement said it would be necessary to acquire 12,000 acres of land on Cape Canaveral adjoining the Banana River base to establish a "safety and security zone."

The department said it hoped to begin extensive tests by July 1, 1951, but noted that construction could not be started until Congress appropriated the money. President Truman has signed into law a bill authorizing an initial \$75,000,000 expenditure but has not yet supplied the funds.

The Bahamas observation posts will be erected along the first 500 miles of the range to keep track of the missiles in flight.

The department said that although more than 109 tests would be made when the project was in "full operation," there would be no danger to residents of the islands and the firings should not cause "any inconvenience to normal civilian activities."

All of the rockets would be duds and each would contain a special device to control them in flight, it said.

(EDITOR'S NOTE: See previous Notes.)

Manpower Short for War Industry

N. Y. *Times*, May 13.—While the critical shortages of World War II were in machine tools and labor, if this country should enter another war its primary shortage would be in manpower, Col. George A. Harvey said yesterday. He made his statement to business executives and reserve officers attending an economic mobilization course given at 30 Rockefeller Plaza by Army, Navy, and Air Force officers of the Industrial College in Washington.

Planners of industrial mobilization must consider the use of a greater percentage of women in industry than was done in the last war, Colonel Harvey said. Women constituted 36 per cent of the total labor force at the peak of the war effort, but surveys have indicated that they could fill 80 per cent of all industrial jobs.

Extensive employment of women in industry gives the community a new set of problems, such as providing for child care centers and baby sitters, readjustment of shopping hours and community facilities, Colonel Harvey pointed out. On the basis of experience in the last war, he said, industrial employers of women may expect greater absenteeism, a greater accident rate, and higher labor turnover.

BETTER USE OF PERSONNEL

Both industry and the military must produce a better performance than in World War II, he continued, and he outlined the steps being taken by the services to attain more efficient use of manpower. These include development of methods to classify civilian jobs for corresponding military jobs, improved personnel accounting systems, job analysis and study and coordination of planning of the Army, Navy and Air Force.

Peacetime education and health programs are being studied because of the high rate of rejections for military service for illiteracy or inability to meet physical standards in World War II. Colonel Harvey said particular attention was being directed to Negroes, who comprise 10 per cent of the population.

Recalling that in the war 7.4 per cent of the white race was rejected for educational deficiencies as compared with 32.1 per cent of Negroes, he added:

"Since Negroes are 10 per cent of the population, they should be called upon to play an even greater part in our national defense than they were able to do in the last war."

GREAT BRITAIN

Carriers Modernized for Jets

The *Aeroplane*, May 27.—Recent developments in jet aircraft for the Royal Navy have meant that some of the Fleet's aircraft carriers now in reserve would be unsuitable for the operation of such equipment. Consequently, a revised programme for the reconstruction and modernization of the carriers has been drawn up.

H.M.A.C. *Formidable*, laid up at Rosyth, will be reconstructed to take the most modern jet aircraft at present featured in the R.N. programme—allowing for designs

which are under development as well as actual prototypes and production aircraft. The flight deck of H.M.A.C. *Indomitable* will be strengthened and her equipment modernized under a twelve-month programme, and H.M.A.C. *Indefatigable* has been surveyed with a view to receiving the same treatment.

Extensive testing of new weapons is being undertaken in the cruiser H.M.S. *Cumberland*, now being refitted as a weapons trials vessel. The weapons include guided missiles, anti-aircraft rockets and radar gunnery control systems, and the tests will last two years. Completion of the three 8,000-ton Defence-class cruisers laid down in 1942 is being delayed until the results of the tests are known.

An Amethyst Story

Manchester *Guardian*, April 22.—Shanghai. British sailors in the shell-battered frigate *Amethyst* armed themselves with rifles and prepared to fight it out if Communists tried to take the ship when she grounded in the Yangtze yesterday, it was disclosed here today. Chief Petty Officer David Heath, of Dartmouth, told of this "death or glory" plan when he led an evacuation party into Shanghai to-day from the crippled, grounded frigate.

Heath was mate to the *Amethyst's* chief boatswain. In a graphic account of the attack on the frigate, he also asserted that two white flags were hoisted as shells whistled at the vessel but, he said, "the Communists must have been colour-blind, as they took no notice and carried on the attack." He said that when his party were ordered to abandon ship they did so under heavy artillery and machine-gun fire.

Chief Petty Officer Heath said the *Amethyst's* crew were sent to action stations about 8:30 A.M. local time yesterday, when some shells whistled overhead but did not hit the vessel. "We carried on," he said. "Then the shore batteries fired again. The wheelhouse and bridge were struck and the captain, as well as several others, were hit. It was a bit of a haze from then on. The next thing we knew we were aground. The steering gear had either jammed or been badly damaged."

BOAT WAS SHELLED

Shore batteries carried on firing, Chief Petty Officer Heath declared, and it was decided that if the Communists tried to take the *Amethyst* the company would try to defend themselves with rifles. "Rifles were issued, but the *Amethyst* was again hit and the plan was abandoned. We hoisted two white flags but the Communists took no notice and carried on the attack."

The ship's whaler was then lowered, and Chief Petty Officer Heath's party abandoned ship. Chief Petty Officer Heath added that the men were about two hundred yards from the shore of Rose Island, where the *Amethyst* had run aground, when "our friends then machine-gunned and shelled us in the water." More casualties were suffered.

Chinese on the island pointed out a path which was not mined, and the men crawled along this for about thirty minutes. A Chinese mess boy from the *Amethyst* then swam across a small bay to the Nationalists, who later sent over boats and took the party to the mainland.

CONSORT'S REPLY

The Nationalists looked after the men who, while waiting to go on, watched the British destroyer *Consort* "having a go, which made us all very pleased," Heath said. The *Consort*, in going to the *Amethyst's* aid, had herself come under fire. She sustained damage and casualties but, in the words of an official statement, "replied effectively."

Chief Petty Officer Heath said that a Nationalist officer led the men to another point about seven miles away. The journey was made at night and some of the men walked barefooted, he said. They had two hours' sleep while the Nationalists brought up three lorries. These took them to Changchow, where they arrived at 5 A.M. to-day. At Changchow a Chinese major looked after the sailors and provided medical treatment for the wounded. The men were given a special coach on a train which brought them to Shanghai. Chief Petty Officer Heath said two fires occurred on the *Amethyst*.

Amethyst Held by Communists

N. Y. *Times*, June 4.—Six weeks after she

first became involved in battle with Communist shoreline batteries the British sloop *Amethyst* is still stranded in the Yangtze River off Silver Island about forty-five miles northeast of Nanking. Thus far the new captain, Lieut. Comdr. J. S. Kerns, has been unable to obtain a safe-conduct pass that would permit the damaged vessel to return to Shanghai.

The *Amethyst* was proceeding to Nanking from Shanghai April 20 for possible evacuation use here when she was fired upon by Communist batteries primed for the start of a general Yangtze offensive.

Three other British naval vessels—the cruiser *London*, the destroyer *Consort* and the sloop *Black Swan*—eventually were drawn into the battle with total casualties reaching more than forty-two dead and 100 wounded.

The Communists have placed their own casualties at 250.

NEW CAPTAIN GOES BY JEEP

Commander Kerns, who held the post of assistant naval attaché here, was dispatched to the scene by jeep April 20 and assumed command of the *Amethyst* following the death of the wounded skipper, Lieut. Comdr. B. M. Skinner. The ship surgeon, Lieut. I. M. Alderton, also was killed.

A new Air Force doctor managed to get aboard the *Amethyst* after a Royal Air Force Sunderland flying boat made a daring landing near by amid the fighting. The original ship complement was about 160. The present crew isolated on the *Amethyst* is said to number sixty-eight, including five officers. Crew members are permitted to barter such ship provisions as fuel for fresh food ashore and morale is said to be good.

According to reports reaching Nanking, negotiations for obtaining a safe conduct pass have been snarled by unknown conditions raised by the Communists and by overall difficulties of all embassy officials here in trying to deal directly with responsible Communist authorities.

Relations between the crew and the local Communist commander at Chinkiang, the nearest major center, were characterized as cordial during the first few weeks after the

incident. The commander there was said to have staged a dinner ashore for eight Chinese-British ratings aboard the *Amethyst* and to have escorted them personally on a sightseeing tour of Chinkiang, which was the capital of Kiangsu Province under the Nationalists.

Since then, however, relations are said to have become "more frigid" and no progress has been made in attempts to get the sloop away from Silver Island.

A British source here said that investigation showed that damage to the sloop was heavy but that she still was able to proceed under her own power and still was "habitable."

British "Jet" Gunboat Starts Test Cruise in Baltic Sea

By John Allan May, *The Christian Science Monitor*, May 21. London.—Nine men and a boat of the Royal Navy are off on a summer cruise—with a difference.

They are showing seafarers of northern Europe the likely shape of things to come in the way of ship propulsion—as well as showing themselves the sights of the Netherlands, Germany, Denmark, Norway, and Sweden.

These men are the crew of the first sea-going ship of its kind in the world. It is a gunboat fitted with a gas turbine—marine development of the very jet motors which give modern aircraft supersonic speeds.

The present normal operational complement of such a vessel would be around 30 officers and men.

FIRST TRIAL IN 1947

His Majesty's motor gunboat 2009—measuring 116 feet long and with 100 tons displacement—had its first gas-turbine trials late in 1947 and its full "acceptance trials" at sea almost exactly one year ago.

After prolonged research tests, it now is being given a heavy schedule of work to do in order to help determine just how long a high-speed though elementary type of gas turbine can stand up to continued use at sea.

The MTB-2009 has one gas turbine and a pair of 1,500 horsepower American Packard gasoline motors instead of the three Packards which are normal in this type of British small craft.



U. S. Navy Photograph

FUTURE ANTI-SUBMARINE WARFARE WILL DEMAND HIGHER SPEEDS

orkel-equipped, speeded-up submarines to defeat, anti-submarine warfare craft will also have to be speeded up. Britain's research into the gas turbine may be the answer.

turbine develops the equivalent of horsepower, yet weighs 5,000 pounds an an orthodox motor. Although of the type, a gas turbine does not drive the y means of a jet, but transmits power ordinary propeller.

NEW DESIGNS NEEDED

ll, not exactly an ordinary propeller. ers and ship-builders have known g like the power for its size of this e. Consequently, new designs of screw ecessary to enable gas-turbine types of to make use of their full power.

ger types of gas turbines, designed from tset strictly for ships, now are being ed in much bigger experimental craft Royal Navy.

s predicted by experts that gas-turbine s in escort vessels of the corvette or

frigate type will annul all the advantages gained at the close of the war and since by superfast submarines.

In a recent statement in the House of Lords, the British First Lord of the Admiralty, Lord Hall, declared: "Plans for the future will enable us to cope with any of the types of fast submarine that are likely to come into existence."

Gas turbines figure largely in those plans, it is thought. At present, similar motors are impractical for submarines because they need a vast amount of air. They would "breathe" more air in one minute than is available in any submarine when submerged.

About the cruise of the MTB-2009, its ports of call are: Ymuiden, Wilhelmshaven, Kiel, Copenhagen, Oslo, Gotenburg, Nyberg, and Portsmouth. The Admiralty states that the ship won't just be flag waving but



"demonstrating to north European countries one of the outstanding achievements of British engineering."

(EDITOR'S NOTE: See Notes, PROCEEDINGS for September, 1948.)

U.S.S.R.

Far East Transportation System

Revue de Défense Nationale, April 1949.—The far-eastern Soviet communication system, sparse in rail and automobile transport, is building a network of air-lines. Numerous aerodromes serving both commercial and military aviation are now in use, seconded by a series of emergency landing fields. Their number is a function of the lack of other means of communication, and frequently the airplane serves areas where no other vehicle has ever penetrated.

Regular lines actually known to exist in the vicinity of the Chinese frontier are as follows:

the Samarkand-Tashkent line toward the Afghan frontier and toward Andijan Och; the Alma-Ata and Frunze network toward the Sin Kiang frontier: Karakol and Djarkent, with an extension in Chinese territory toward Kouldja, Wu Su, Dihua; the Irkutsk lines toward Ust-Kut and Yakoutsk; from Ulan-Ude to Ulan Bator; from Tchita toward Lake Baount; from Roukhlovo toward Nezametnyi and Nijne Stalinsk; from Blagovechtchensk toward the branching of the Ekimohan; the line of Vladivostok, Khabarovsk, Komsomolsk toward Nikolaevsk and Okha and Alexandrovsk doubled by the coastal line from Vladivostok, Sovietskaya Gavan, Nikolaevsk toward Aian, the coast of the Okotsk Sea and Kamtchatka.

All these lines and networks are linked with Moscow, either directly for the networks of Central Asia, or by the aerial "magistral" that follows the Trans-Siberian railway, and are united in the Far East to the great line of the 60th Parallel.

The importance of communications for Russia is clearly indicated by the attention devoted to them by the successive 5-year Plans: construction, reconstruction, doubling, increase of traffic, additional rolling stock. The 3rd Plan, interrupted by the last world war, provided for an increase of 44%

in the merchandise traffic over rail lines and 11,000 kilometers of new highways, as well as an increase of 200% in the total number of automobiles. The 4th Plan, begun in 1946, goes beyond these provisions. It seeks at once to decrease the need for long and costly hauls and increase the possibilities of communication networks for especially strategic reasons. In order to "increase still more the defense potential of the U.S.S.R.," the plan provides "increase of great construction projects in all the Federated Republics and economic regions of the U.S.S.R. and especially in Siberia and in the Far East." 11,000 kilometers of new highways and 7,000 kilometers of new railways are to be in use by 1950.

AVIATION

Light Aircraft for Armored Cavalry

Armored Cavalry Journal, May-June, 1949.—Armored cavalry has something new! Something it has never had before; something it has always had to borrow; something challenging! That something—*light aviation*!

The recently published Tables of Organization and Equipment for the armored division and the armored cavalry regiment (light) contain this seasoning ingredient for the team recipe. Armored Cavalry can put its hooks into a valuable medium.

There is a wealth of experience with light aviation in many sources on which the arm may draw in adapting this tool for its use. Planes are now provided at headquarters level, separate and distinct from those assigned to the artillery units, and are there for allotment as needed to combat commands, the reconnaissance battalion, and the tank and armored infantry battalions. Keeping that in mind, let's put the eye on equipment and personnel. Some of the facts are startling and revealing.

A light aviation section normally consists of two or more light aircraft, an officer pilot for each plane, and sufficient mechanics and equipment to keep the planes operational. The planes are the light single-engine type which are characterized by their maneuverability and ability to land in short fields and on roads. *The pilots for armored cavalry units are Armored Cavalry Officers.* They are not Air Force officers, and they are not Artillery

rs. They are Armored Cavalry officers have been trained by the Armored Cavalry, and they know and understand the technique, tactics, personnel, and matériel of Armored Cavalry. They are first of all men of their arm; secondarily they are men of organic light aircraft.

Flight Instrument

Mechanical Engineering, June, 1949.—In the opinion of experienced pilots who have used it, the zero reader, a new and revolutionary type of flight instrument, can lower altitudes from 400 to 100 ft., members of The American Society of Mechanical Engineers told recently at a Metropolitan Section meeting at the Engineering Societies Building, New York, N. Y.

Although developed and designed particularly for aircraft use by the Sperry Gyroscopic Company, its principle is adaptable to simplification of the manual control of the most complex mechanisms, Spencer Kellogg C. F. Fragola, of the Sperry Company, said in a paper presented to the engineers.

The practical performance of this instrument has been demonstrated in hundreds of flights, including flights by the U. S. Air Force and most of the commercial airlines. Many of these demonstrations were conducted entirely by the Air Transport Association.

Explaining that the zero reader is a "synthesizer," the authors stated that by appropriately combining data from basic flight navigational instruments in its control panel, it reduces the most complex simultaneous demands of attitude, altitude, heading, and instrument-landing requirements to a net demand of simply maintaining altitude.

By separating the "plan of flight" from the "mechanism of flight," flying with the zero reader consists of once setting the plan and then following it by merely making indicated attitude changes as dictated by instantaneous deflections of the zero reader indicator.

The key pointed out that the great simplification of aircraft control which the zero reader provides, permits the pilot much more freedom to monitor proficiently all other conditions pertinent to safety of flight. It enables

the pilot to achieve greater accuracy and performance with less expended skill and effort.

Use of the zero reader was not advocated as a primary flight instrument because it does not give any fundamental data of the aircraft or what it is doing. It only tells the pilot that he is flying "according to plan." The indicator, in general, shows neither pitch, roll, heading, altitude, nor departure from the radio beam. For this specific information, the primary instruments, such as the attitude gyro, gyrosyn compass, altimeter, and conventional radio deviation indicator must be relied upon.

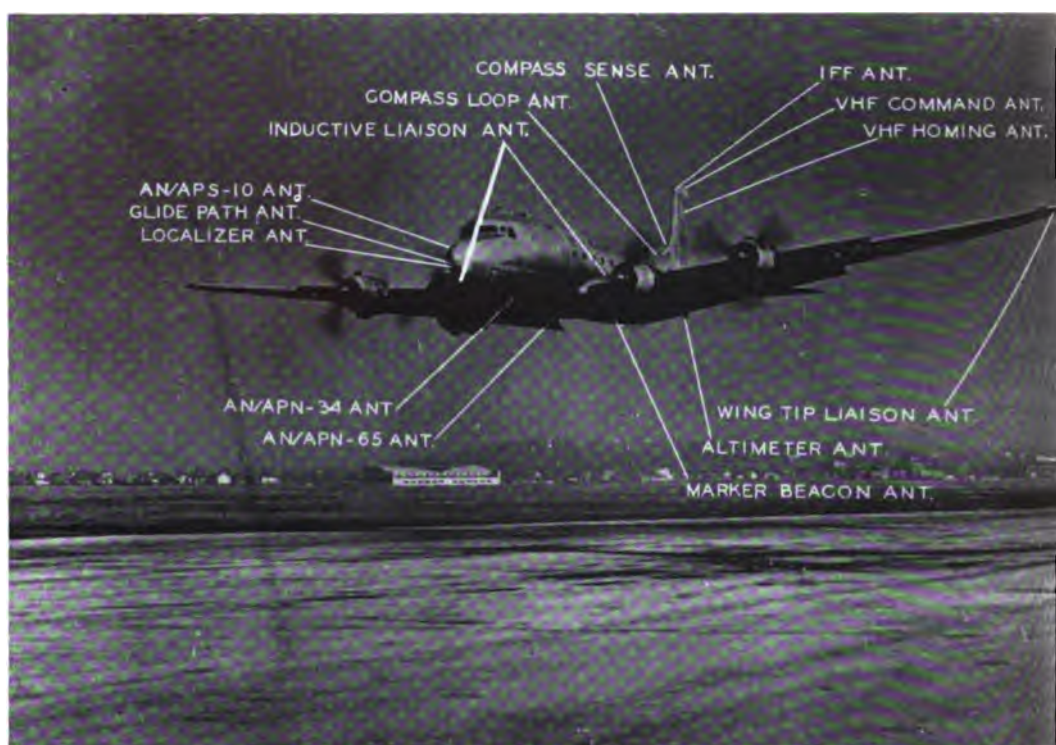
Although automatic approach, developed and proved before the zero reader, has been providing excellent performance, it is expected that the zero reader can serve as a good stand-by, the authors stated. They said that the reader should encourage pilots to accept automatic approach more readily.

To be an effective stand-by, the zero reader should give the pilot confidence that he could consistently make manual approaches with it, they continued. To serve this function, the zero reader has been kept absolutely independent of the gyro-pilot or automatic approach equipment.

The zero reader consists of a source of gyro stabilization in the form of a vertical gyro for pitch and roll signals, and a stabilized gyro compass for yaw or heading signals. To this source is added various control functions such as altitude and radio-beam signals. These signals are carefully combined such that roll, heading, and radio beam control the vertical pointer, while pitch, altitude, and glide path control the horizontal pointer of the indicator.

Electronics in Air Power

The Engineering Journal, May 1949. By Wing Commander C. B. Limbrick, Director of Air Plans (Scientific), R.C.A.F. Headquarters, Ottawa.—It is necessary to understand what is meant by "Air Power" and "Electronics" before attempting to discuss the role of electronics in air power. With the advent of guided missiles there has been, inevitably, considerable controversy and discussion as to the present exact meaning of "Air Power." The writer's personal definition



Official U. S. Air Force Photograph

ELECTRONICS ARE A REQUISITE FOR AIR POWER

An Air Forces C-54, showing the relative locations of the fifteen different but vital antennas required in its operation. To reduce "drag," all these antennas are being "flush mounted" under the aircraft skin.

is: "An armed force, and its ancillaries, that normally utilizes air as the supporting element for the manoeuvres of its principal military equipment."

It seems that the descriptive word or term "Electronics" is now often used to classify most, if not all, devices using electricity, for operating power; for instance, advertising signs, toasters, toy trains, etc. For the purpose of this paper "electronics" may be defined as the application of thermionic tubes or valves to devices used in air power. Other electric apparatus employing tubes, such as diathermy machines, movie sound machines, etc., could be classified as electronic devices and as components of air power. This, because human beings are necessary for some part of the operation and maintenance of all military functional equipment, and such electrical devices not generally included under the classification of "military electronics," are necessary in the

general maintenance of health and morale of air force personnel.

The air power of today, employing aircraft flying at velocities close to the speed of sound, and guided missiles travelling at supersonic speeds, require precision senses for their efficient and safe operation. So we may well define electronics when applied to air power as the "central nervous system" tying together, and stimulating, as required, all the varied equipment that requires activation with great rapidity and accuracy of timing, to ensure efficient operation of the whole system or force.

HUMAN SENSES TOO SLOW

The time is rapidly approaching when even the relatively concise and speedy co-ordination of brain and muscle by a healthy young man is not good enough to ensure the necessary operation of aircraft controls. Brain and muscle may not provide the rapid

ed aerial movements of transonic aircraft in combat operations. is limited and affected by re-action fatigue, errors of muscle co-ordination and correction of minute without appreciable time lapse, of judgment.

requirements of functional equipment in air power are almost fantastically far beyond the limits of human accomplishment. They are far better than certain amazing powers of many birds, and also beyond possibilities of training human senses. Humans cannot see or hear far enough or high; we cannot speak with sufficient reach any great distance nor with ease of security against eavesdroppers, say sufficient words per minute to the required amount of information high for high speed operations. Practically the main sensory powers of man are improved beyond the limits of human nature or training, if air power is to use of modern high speed aircraft temporary equipment.

Further, due to the speed and complexity of modern aircraft and weapons, and operations in an element unnatural to the activities of humans, requires extra powers of mental and physical effort. Systems for ground control of operations also require special qualifications to exploit the operational potential of modern aircraft. The brain functions of men are not sufficiently fast or strong to fulfil all the stringent demands. Extra effort is required beyond normal capacity and endurance. In addition to the necessity of providing devices to assist human powers, means must be available to oppose forces the use of similar air power employs many ingenious countermeasure equipment designed to annoy the enemy and to offset dangers to our electronic material.

It may be divided into three categories: those manned and operated by aircrew which normally rely on the human element aided by any extra devices; aircraft operated by instrument assisted aircrew; and machines which normally are flown and operated entirely by automatic devices.

The first type is rarely encountered in military formations; the second is the normal situation in modern air forces; and the last is partially in being and will perhaps be in general use by say 1955 or 1960. In addition to aircraft and guided missiles, air power utilizes many devices and weapons which require automatic or semi-automatic operation and control. This automatic operation is nearly always provided by electronic equipment.

IN MILITARY OPERATIONS

It is, then, quite evident that man has dreamed of, designed and produced military aircraft, flying machines, and weapons, so complex and fast that his normal senses, though highly trained, are not suited to adjust themselves to this new conception of air power. Here electronics in many forms has taken over the task, permitting man to produce, and operate efficiently, modern air machines, and to cope with the exotic air power of the future. Without electronics, air power would be almost useless, and any country or nation that does not maintain progress in the development and use of electronics can not compete with those nations whose air power utilizes to the full the assistance provided by electronic devices.

As a result of new concepts of "Blitz Krieg" and "Superblitz," movements and operations must be timed with extreme precision. Those responsible for planning and operation of air power must now consider space in terms of time rather than of miles, with aircraft flying at six to seven hundred m.p.h. and guided missiles with velocities of over 3000 m.p.h., all operational movements and communications must be both rapid and accurately timed. Electronics have demonstrated what supervelocities can do to shrink our world. It matters little to people at each end of a radio telephone terminating at Ottawa and London that the space between terminals is 3500 miles. To the conversing parties there is no perceptible time lag, and therefore no space between the parties. However, the tremendous speed of electromagnetic waves is barely high enough to cope with modern air power requirements. Automatic equipment, more efficient operating techniques, and new terminal equipment

must be employed to overcome delays which would cancel the advantages of radio velocities. Considerable effort is being expended to find a solution to limitations in the use of micro-wave devices, due to relative short ranges of line of sight transmission.

There exist no mechanical timing devices which can provide the accuracy necessary to ensure rapid activation and operation of defence and attack forces, and to collect and integrate all the information that must be available to ensure the optimum use of air power at the disposal of a commander. Electronic methods of timing use the highest speed available to man, that of light. This speed, together with an accuracy of better than one quarter of a millionth of a second, provides a timing device unequalled by any mechanical device. Electronic equipment will accept and reject matter from many sources of information. It will integrate, compute and display the final complete answer. If necessary, it will automatically encypher the information, despatch it to many centres and there automatically decypher and display it. Such necessary operations may be carried out without help from humans except to start, stop and maintain the electronic equipment.

IN RESEARCH AND DEVELOPMENT

Many are familiar with the more spectacular aspects of electronics used by air forces; such devices as early warning radar, controlled interception, automatic pilots, navigational aids, etc., are well known. Essential devices to ensure precision timing and rapid computation are often overlooked. Electronics not only fill requirements for accurate timing and rapid calculation for operational uses. It also provides similar methods to assist in accelerating research and development of new aircraft and weapons. Electronic computers can do in one hour the same amount of work that could be done by an experienced mathematician in six months. The nation which can produce "the best the fastest" usually has the better chance of success. Electronic calculators, telemetering devices, industrial controls, simulators and many other instruments assist in the speedy production of new airborne and associated ground equipment for military use.

Perhaps the best way to illustrate the size and complexity of the electronic role in air power is by the use of a chart showing the various functions of electronics in the different departments of a modern air force. The chart shows the breakdown without much detail, for example, "Navigational Aids" could be further broken down into its many functional aspects such as: Long Range Navigation, Ground Controlled Approach, Distance Measuring Equipment, Homing Beacons, Airfield Surveillance Radar, etc.

Electronics have become so indispensable to air power that the old practice of stowing the electronic gear in spare spaces has disappeared. Modern procedure is to include in the original aircraft layout properly sized spaces in correct relation to the function of each piece of electronic equipment. Space requirements for electronic devices are given a high priority and serious consideration is necessary before electronic gear is discarded to make room for something else. In this atomic age the atomic bomb is, and must be, associated with air power. Research on atomic power and actual construction of atomic bombs is not possible without electronic control and measuring equipment. The basic research into atomic fission was carried out with the aid of complex electronic equipment. Precise and delicate measurements must be made with remote control, and this is only possible through electronics.

It is certain that electronics will steadily progress in value to air power. As the speed and versatility of aircraft and missiles increase, automatic control will ensure defense and offense with a minimum of human loss to the air power with superiority in electronic development.

IN CIVIL AVIATION

In our ever decreasing time-sized world, rapid and accurate communications are essential both for military and civilian purposes. This will be accomplished by the development of micro-wave relay, airborne and ground based. It can be accomplished by the increasing use of co-axial cable which, in an emergency, might well be laid by aircraft. Telephone cable has already been placed in position from aircraft flying at over 100 m.p.h.

Fig. 2

FUNCTIONS OF ELECTRONICS IN AIR POWER

OPERATIONAL

Varning	Communications	Rocket Ranging	Supercharger Control
Control of Interception	Safety Devices	Operations Room Devices	Altimeters
Warning	Blind Bombing	Computers	Identification
Warning and Ranging	Countermeasures	Magnetic Recording	Submarine Search
Position	Search and Rescue	Television (Control)	Missile Guidance
Electronic Control	Air Interception	Facsimile (Weather)	Bomb Control
	Cloud and Collision Warning	Proximity Fuses	

TRAINING

Synthetic Trainers	Demonstrators
Sound Movies	Magnetic Recording
Link Trainers	Communications
Gunnery Devices	

ADMINISTRATIVE, MAINTENANCE, RESEARCH & DEVELOPMENT, MISCELLANEOUS

Logical Devices	Photo Electric Devices	Intercommunications	Power Supplies
Transmitters	Communications	Measuring Devices	Industrial Controls
Car	Cypher and Code Machines	Survey and Mapping Aids	Simulators
Instrumentation	Ionosphere Measuring	High Frequency Heating	Telemetering
Signal Control	Infra Red Detection		Timing
Systems	Heat Detection		

The use of electronic devices by civil aviation is equally important. Peacetime development of military equipment is of course rather than under the stimulus of war, but lately electronics is one of the arts in which both military and civilian functions. Therefore, development may be coordinated and carried out with economy. For example, development of unattended radar beacons or radio-wave relay stations would be of great value to commercial airways or for military

In conclusion we can recapitulate by stating briefly that the role of electronics in air power is to extend limits of the human sensory system; to assist and augment human physical effort; to increase the capacity of the human mind in time/quantity terms; to reduce loss of life and equipment; to provide rapid and secure communications over long distance; and to furnish a versatile tool for the use of scientists and engineers.

Jet Bomber

The Aeroplane, May 20.—Britain's first jet bomber, the English Electric A.1, built to the Air Ministry's B3/45 specification, made its initial flight on May 13 at Warton, Lancs. Powered by two Rolls-Royce Avon axial-flow turbines, the A.1 is the aircraft to which Mr. Arthur Henderson, Secretary of State for Air, referred when he

presented the 1949-50 Air Estimates on February 23 (reported in *The Aeroplane* for March 4). The development of other jet bombers of "exceptionally high performance" was disclosed at the same time.

On its first flight the A.1 was piloted by Wing Cmdr. R. P. Beamont, who had done extensive taxi-ing and preliminary "hops" with it the day before. These trials were completely satisfactory and on the subsequent maiden flight the aircraft was flown for about 20 mins. and taken up to 8-9,000 ft.

No details of the English Electric A.1 are available at present, but it is clearly intended as a medium-range medium-size type. The designers have not attempted anything in the way of unorthodoxy in general configuration, but have confined themselves to a straightforward layout with exceptionally clean lines. The "single" tail unit has a tailplane with a small dihedral to clear the twin jet exhausts.

Naturally, the question that is foremost in most people's minds is that of production and availability for Service use. Here again no details are available, but from the date of the specification there has been plenty of time for tooling up production.

Russian Fighter Crashes in Sweden

Manchester Guardian, May 20, Stockholm.—Experts from the Royal Swedish Air Force to-day began investigating the Rus-

sian fighter which yesterday afternoon crash-landed on the military airfield at Tullinge, just outside Stockholm. It is a Lavochkin XI, one of the very latest types of propeller-driven Russian planes, of which very few, if any, have fallen into the hands of aviation experts of another country.

The plane is 30 ft. 3 in. long with a wing span of 34 ft., and its 1,800 h.p. radial engine gives it a speed of 375 miles an hour. Rumor says there is another auxiliary engine which can increase the speed to 470 m.p.h. The Swedish experts also expect to get highly interesting results from a study of the instruments and constructional details.

EMBASSY REFUSED

The Russian pilot, a 27-year-old lieutenant, who was alone on board, made a very bad landing, and one wing was torn off when it hit a small hill on the edge of the airfield, but otherwise the plane was undamaged. The pilot, questioned at police headquarters, is reported to have said he started from somewhere in Byelorussia and had left because he was dissatisfied with conditions in Russia. He asked to be treated as a political refugee, and it is expected his request will be granted.

The Soviet Embassy last night telephoned the Swedish Foreign Office demanding permission to interview the pilot, but this was refused until the police report had been studied. Embassy officials were refused admission to the airfield. The plane will be handed over to the Russian authorities if they ask for it, but not until all its secrets have been studied.

Giant French Transport

Aviation Week, May 30.—Two behemoths—the U. S. Boeing Stratocruiser and France's even larger SE 2010 Armagnac—set the pace for transports at the 18th Paris Air Show. But they left visitors with the feeling that the race for size in commercial aircraft had just about ended.

The Stratocruiser, belonging to Pan American Airways, convinced some air experts that it comes too close for comfort to the point of diminishing returns. Airlines however, judging by their orders, seem to think otherwise. So do some manufacturers,

both American and European, who seem to be pegging future plans on anticipated widespread use of huge transport aircraft.

PROTOTYPE HAS FLOWN

The Armagnac is the first long distance commercial plane of international class produced in France since the war. While only the prototype has flown, Air France has ordered 15 for its Paris-New York run. The Armagnac is the French counterpart of the Constellation—but much bigger.

Gross weight of the craft is 73 metric tons (about 161,000 lb.) and payload is eight metric tons (about 17,500 lb.). Span is 164 ft.; height, 44 ft.; length, 129 ft. It carries 94 passengers.

Cruising speed fully loaded at 18,000 ft. (at 1750 h.p. per engine at 2375 r.p.m.) is 300 m.p.h. Range is 2500 miles. Power is supplied by four Pratt & Whitney R-4630s, developing 2650 h.p. at 2550 r.p.m. at 6000 ft., and 3200 h.p. at 2700 r.p.m. at takeoff.

MERCHANT MARINE

Shipbuilding Yards

N. Y. *Times*, June 9.—A Navy admiral said today it is not in the interest of national defense now to divide the building of Navy ships among shipyards of the various coasts.

Such a distribution of work said Rear Admiral Charles D. Wheelock is desirable only if there is sufficient work to be spread out among the yards of the East, Gulf and Pacific Coasts.

But he cautioned against reducing below a minimum the work of certain East Coast yards which he said are the only ones now capable of turning out "complicated combatant ships."

He said he was referring to private shipyards and not to Government-owned yards. Admiral Wheelock testified before a House Merchant Marine subcommittee studying legislation to require allocation of Navy and Maritime Commission shipbuilding work to yards of the three coasts on a percentage basis.

The admiral, who is attached to the Navy's Bureau of Ships, said there now are about 31,000 workers employed in East Coast yards and that the Navy is particu-

interested in those yards which now are being about 19,000 of that total.

SUBSIDIES

Other House Merchant Marine subcommittee was told today that cheddar has received a bigger Government subsidy than has American shipping.

Mr. A. Bailey, president of the National Association of American Shipping, Inc., in the comparison, he said, to dispel "a widespread idea that shipping is the recipient of disproportionate favors."

Supplementing previous testimony given before the committee on long-range shipping legislation, Mr. Bailey said there had been in the past "continual inferences concerning excessive payments which intimate that shipping holds a highly preferred position in dealings with the Government in this country."

Mr. Bailey said figures of the United States Department of the Budget show that for the fiscal years 1934 through 1948 the Federal Government paid subsidies to business and farmers \$1,525,217,000 and added: "Of this total the United States Maritime Commission paid out in operating shipping subsidies the amount of only \$49,368,000, or less than one-thirtieth of 1 per cent thereof, and for production subsidies—which are designed to offset the high wage cost in American shipping—the sum of \$341,013,000, or 2.3 per cent thereof."

When recapture profits (a portion of shipping company profits the Government is entitled to by law) are credited against the shipping subsidy the net amount becomes \$24,127,000 for the fourteen-year period or seventeen one-hundredths of 1 per cent.

SCIENCE

Notes on the Atom Bomb

National Geography Journal, June, 1949.—From data in the Smyth report and elsewhere, J. A. Sells of the Severance Chemical Laboratory, Oberlin College, came up with some educated guesses in the *Armed Forces Chemical Journal* about the atom bomb and nuclear energy.

"It can be deduced," he says, "that the

size of the explosive charge is about 30 pounds with about the same diameter as a softball. Any size smaller than this would allow neutrons to escape on the average before colliding with fissionable nuclei so that this is known as the critical size. No smaller atomic bomb can be made, and any larger piece will explode spontaneously. Thus there is no possibility of a weakly explosive atomic bomb. One either creates a city destroying blast or no blast at all."

QUICKER AND CHEAPER

"It is safe to say that atomic bombs will not do much that cannot be done with other weapons, but the destruction can be wrought so much more quickly, so much more cheaply, and so much more unexpectedly as to raise this weapon into a class far more powerful than the past weapons of war." Einstein summarized it neatly when he said, "The atomic bomb has created no new problems; it has merely made it more mandatory that we solve some of the old problems."

Despite the fact that it is "safe to say that a guided missile, powered by atomic energy, carrying an atomic bomb to any spot in the world, is in the foreseeable future" there are many who predict that no atomic bomb would be used against cities were another war to start. This is not from any desire to save civilians but only because other weapons may be considerably more effective.

IN FOURTH PLACE

"In fact, a high official recently stated that atomic bombs now rank fourth in our arsenal of weapons. We shall leave one of the four weapons in the secret class and suggest that . . . biological warfare will almost certainly outrank atomic bombs in effectiveness . . . the other one is a radioactive dust or spray."

"The atomic bomb is too effective. Much of our present trouble in Europe and Asia is due to the effectiveness of explosive bombing and the consequent destruction of property. It would be much better if the property could be rendered useless for a specified period of time at the end of which it could be rehabilitated. Such possibilities are latent in radioactive clouds."

SECRECY

Concerning the secrecy about atomic weapons, Mr. Campbell points out that there are four kinds of secrecy dealing with weapons: (1) the fact that you have it; (2) the method of using it and its effectiveness; (3) how many you have; and (4) how you produce it.

Pointing out that secrets 1 and 2 are no longer secrets, he goes on to deduce, from published reports, that we are manufacturing about one bomb a week, which would give us a maximum stockpile of about 200 bombs. Secret 4, how you make an A-bomb, "has been kept quite well . . . but it should be clearly noted that it is only the details of the method which are secret . . . any feeling that secrecy here guarantees a monopoly of this weapon is bound to be wrong."

In addition to these guesses and conclusions, Mr. Campbell rounds up very neatly in layman language, everything that has seeped out about nuclear energy. His account makes absorbing reading, and right or wrong, he does no more than any intelligent foreign agent presumably has done.

Improved Lifejacket

N. Y. *Times*, June 10.—A lifejacket that will hold the face of a man upward and out of the water is under development by the British Navy. It is one of several improved devices to increase the chances of survival of persons forced to abandon ship.

The jacket is designed to replace earlier types of lifebelts and jackets in which many men have died because unable to breathe. It will automatically turn even an unconscious man face upward and support him high enough to keep mouth and nostrils clear of the water.

A lifeboat has been developed which is somewhat similar to the rubber aircraft dinghy used by the Royal Air Force for pilots downed at sea. In comparison with the liferafts of the British Navy, it is lighter and is equipped with a tentlike covering for protection against all types of weather. The equipment carried by it will include food, water, signal lights, fishing line, sea anchor, first-aid kit and a radar reflector.

(EDITOR'S NOTE. The U. S. sea services have long led in the development of life-saving apparatus.)

INTERNATIONAL

French Admiral Runs Armada of West Europe

N. Y. *Herald Tribune*, June 11.—Fontainebleau, France.—A landlocked admiral, seated at a desk 125 miles from the sea, will have nominal command of the first Western Europe fleet maneuvers, to be held in the English Channel this month.

For the first time in naval history, British, French, Dutch and Belgian ships-of-war will sail for one week under a single command. They aim to show that, on sea as on land and in the air, the forces of the Western European Union are capable of fulfilling their tasks as a unit, should need arise.

As nominal commander of the combined armada, Vice Admiral Robert Jaujard, of France, has his biggest and most responsible duty since his appointment as admiral, Western Europe, in October of last year.

Admiral Jaujard at present has only a small staff of co-ordinating officers working with him in the annex of Napoleon's chateau at Fontainebleau.

MUST UNIFY EFFORTS

Like a kind of chairman of a board, he must check and co-ordinate the various plans and information submitted by the national admiralties, ironing out rough spots, soothing any ruffled sensibilities, trying to forge a unified weapon to protect the Western nations on the sea.

Admiral Jaujard himself knows what it is to sail his ship under foreign orders.

Soon after his promotion to rear admiral in 1944, he took command of the French cruisers *Georges Leygues* and *Montcalm* at Scapa Flow in Scotland. Under British higher command, he directed his ships in the Normandy landing at Omaha Beach and later in the Southern France landing at St. Tropez.

Again Admiral Jaujard had British destroyers under his orders as commander of the inter-Allied naval task group which blockaded the sea approaches to the Gulf of Genoa in the closing phases of the war.

A thin, wiry man of fifty-three, with close-cut gray hair and neatly trimmed mustache, Vice-Admiral Jaujard looks more like a British colonel than a naval man. But he

his gold-laced cap at a jaunty angle, back on his head, and his eyes have a look.

and the big oak table of his white-l office Admiral Jaujard finds himself a desk admiral today.

in interview he said his various communication problems were "absorbingly interesting," but added: "Of course, whenever ship, I want to get to sea again."

main problem," he said, "is the problem of getting ships, whose crews speak one language, to co-operate faultlessly with other ships whose crews speak a different language. We are, however, studying the internationalization of signals and naval procedure. Here in Fontainebleau my staff have to talk French one day and English the next, carrying out their work."

Like many French sailors, Admiral Jaujard was born far from the sea, in Poitou. He was studying at the naval school at Brest when World War I broke out and the school was closed.

An able seaman aboard the armored cruiser *Jeanne D'Arc*, he was present at the Italian landings in April, 1915. When the naval school reopened later that year, he returned to his training, but later served two years aboard destroyers on convoy duty in the Mediterranean.

HELPED TO SHELL GENOA

Between wars he had a long series of commands as a junior officer and later as a ship-in-command.

When World War II began in September, 1939, Admiral Jaujard was commanding a cruiser, which escorted convoys between the Mediterranean and Gibraltar and between Bordeaux and Casablanca. He took part in the bombardment of Genoa when Italy entered the war in June, 1940.

When the Americans landed in North Africa, he was in command of the cruiser *Leygues*, which sank the German merchant ship *Dortland* and brought 1,000 prisoners to Dakar. After being commander at Algiers for a short while, he was promoted to rear-admiral.

After the war, he commanded the French Cruiser Division, then raised his flag as admiral on the new 45,000-ton battle-

ship *Richelieu*, pride of the French fleet. He left the *Richelieu* last October for his desk at Fontainebleau.

(EDITOR'S NOTE: See Professional Notes, June PROCEEDINGS.)

New Weather-ships Agreement

The Aeroplane, May 20.—A new I.C.A.O. agreement for the positioning of Ocean Station Vessels, signed in London on May 11, provides for 10 stations in the North Atlantic. To date 11 of the originally proposed 13 positions have been manned, but unlike the old agreement which specified the number of points in the North Atlantic to be filled, the new arrangement more specifically lays down the number of ships required from each country.

The three stations which have been withdrawn are in the Southern half of the North Atlantic, but to close the gap five existing positions will be re-located. In reducing the number of ships the technical justification for 13 stations was outweighed by limitations of finance. The deletion of positions in the Southern region was largely dictated by the presence of island observation posts; for example, the Azores, and the more stable weather in that region.

Twenty-five ships, compared with 33 under the old arrangement, are to be provided: 14 by the U. S.; Canada, one; Britain, four; France, two; Netherlands, two; Norway two. Belgium has dropped out as a ship operator but will pay £26,000, mainly to Norway. European commitments on the stations show a very slight increase, with one of the Netherlands's ships assisting the U. S. on position "A."

Certain financial adjustments between European countries directly relating their contributions to the benefits derived by their air services are provided in the new agreement which will run for three years from the termination on June 30, 1950, of the original contract. In addition to the countries running air services across the North Atlantic, Portugal and Ireland are to provide funds towards the stations' general upkeep.

No overall cost of maintaining the 25 ships was available but a rough guess would put it in the region of \$12,500,000 (£3,100,000) each year.

To reimburse Denmark for providing meteorological facilities in Greenland and operating a Loran station in the Faroes, a decision was reached to pay £425,000 towards the total current costs and £185,000 or 90 per cent of the annual cost each year. This arrangement covers the financing of 10 meteorological stations, representing by far the largest proportion of the expense, and the master Loran station in the Faroes. Other stations are at Vik in Iceland and Mangerstar in the Hebrides.

Payment for the meteorological facilities for the current year is based on each country's volume of traffic across the Atlantic in 1948. Belgium will pay 1.7 per cent., Canada 9.8 per cent., France 5.3 per cent., Iceland 1.8 per cent., Netherlands 6.3 per cent., Norway 1.6 per cent., Sweden 2.2 per cent., U. K. 9.6 per cent. and U.S.A. 51.7 per cent. These proportions are to be adjusted from year to year.

Payment for both the weather services in Greenland and the Loran facilities is purely voluntary, for I.C.A.O. puts no pressure on its members. New transmitting equipment is to be fitted to the Loran stations following complaints from fishing vessels that the navigational aid was interfering with their communications radio.

ATLANTIC WEATHER INFORMATION

Plans for increasing the speed and efficiency of meteorological telecommunications facilities on the North Atlantic Ocean Region have been drawn up by I.C.A.O.

Central clearing points to be operated for the collection and distribution of weather data on each side of the North Atlantic, one at Paris and the other at New York, have been recommended. European weather data will be collected at Paris and transmitted by duplex radio teletype via Santa Maria, Azores, to New York. Weather data from the North American continent will be collected at New York and transmitted to Paris.

A number of other recommendations have been made, aimed at speeding up the handling of weather messages across the North Atlantic, including the adoption of a new set of abbreviations. Changes are expected to be in full effect by October 1.

Crisis Brews in Orient

N. Y. Times, June 11.—By H. W. Baldwin.—The slow but steady advance of the Communist armies toward Hong Kong and the impending withdrawal of the last United States troops from Korea may precipitate another crisis in the Orient.

Hong Kong, for more than a century a Far Eastern outpost of British power and prestige, may soon become (ideologically as well as physically) an island in the midst of a Red Sea. When the Communist tide engulfs Canton, the connection of Hong Kong by rail with the rest of China might be severed effectively. The island's subsequent complete isolation—except by sea—will then be only a matter of time, if the Communists will it.

Hong Kong will be, in other words, the first major test of the policies of the Chinese Communists toward the Western world. Will they revive, with a new twist to fit the party line, the old slogan, "China for the Chinese?" Will they attempt to isolate or blockade, or even to attack the little island, ceded to Britain by China in 1841, an island that has long been a haven of order in a turbulent land?

BRITISH TAKING NO CHANCES

Armed attack seems highly unlikely, but the British are not taking chances. Sizable reinforcements, including infantry, artillery and armor, sailed from England in the first half of May and should soon be debarking in Hong Kong; others followed a few days ago. The ultimate strength of the reinforced garrison will consist of two brigade groups (each approximately the equivalent of a United States regiment), plus supporting troops totaling about 6,000 men. Ancillary formations, including air and naval units, may bolster the total strength of all of Hong Kong's armed forces to some 12,000 men.

Hong Kong's strengths and weaknesses were underscored during the Japanese assault in December, 1941. In seventeen days, the Japanese, attacking with 40,000 men, overran the entire Crown Colony, defended by about 6,000 men. The loss of the colony's only airfield on the mainland, and food and water shortages quickly proved decisive; a

bastion which it was thought could hold out for three months was quickly conquered.

Some of the weaknesses—but not all—revealed in 1941 have been remedied today.

Hong Kong is really three areas. The island of thirty-two square miles is fundamentally dependent for any protracted or successful defense upon the adjacent mainland, from which it is separated at Lyemun Pass by only half a mile. The $3\frac{1}{4}$ -square-mile Kowloon Peninsula on the mainland, which is British territory, lies directly opposite the town of Victoria on Hong Kong. The defense of these areas is dependent in turn upon the successful defense of the leased territories (leased from China until 1997) of some 355 square miles—a mainland area, embracing two hill ranges, surrounding Kowloon.

The colony's only airfield, which is grossly inadequate for modern air operations, is not far from Kowloon on the mainland. A fighter squadron of sixteen planes has been dispatched from Malaya to base on this field. Hong Kong, with its important naval dockyards, is one of the bases of the British Commander in Chief in the Far East, Sir Patrick Brind, whose naval forces include two cruisers, five destroyers and five frigates. An additional cruiser is on the way.

The deficiencies in water supply and in food storage, which handicapped the defense of Hong Kong in 1941, have been at least partially rectified; there are new water reservoir tanks on Hong Kong Island and water pipelines run under the bay from Kowloon. Large stocks of rice have been stored for Hong Kong's 2,000,000 population. The British police have been well trained in anti-subversive and anti-sabotage action.

But Hong Kong, geographically, is an isolated bastion of British power, which can

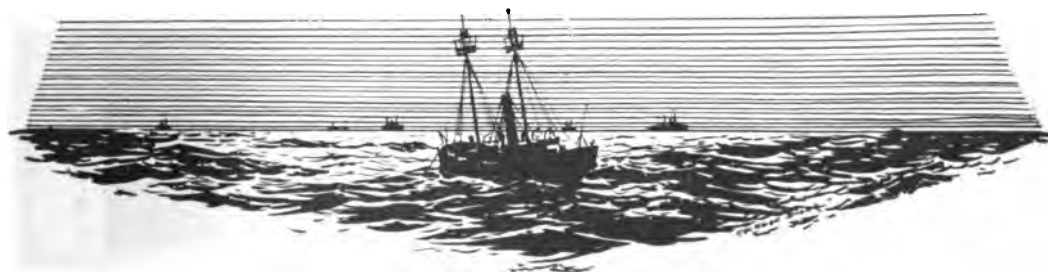
be cut off from the China mainland by the simple expedient of blockade, and its defensive capabilities must be measured, at least in part, by the concepts of 1898, when the leased territories on the mainland were acquired to keep Hong Kong and Kowloon out of the ranges of mainland guns. Hong Kong will be a test case of Chinese Communist intentions.

SOUTHERN KOREA INDEFENSIBLE

But Southern Korea, soon to be evacuated by the few remaining United States troops, is in no sense a test of Communist intentions. The North Korean Communist-dominated puppet government already has made its intentions toward South Korea quite obvious. Those intentions are plainly disorder, subversion, riots, bloodshed, and eventually conquest and domination.

Southern Korea has been—strategically—indeffensible since the Communist conquest of Manchuria. We have never been able to guarantee a free and independent Korea, and should never have made such a promise; the Yalta terms, exclusive of other factors, made the keeping of such a promise practically impossible.

The presence of United States troops in Southern Korea has been the real major deterrent to domination by the north. With the departure of the last of those troops by July 1, there will remain only the relatively weak military and police forces of the Southern Korean government, forces which are none too reliable politically. The appropriation of \$150,000,000, therefore, for Economic Recovery Administration aid to Korea in the coming year could well mean money down the drain; this request should be evaluated carefully.





Official U. S. Coast Guard Photograph

FROM THE SOUTH SEAS TO THE ARCTIC

Having landed tanks and other equipment all over the temperature climes, the Navy LST is now going to become an amphibious tanker in the Arctic.

UNITED STATES NAVAL INSTITUTE PROCEEDINGS

*For the advancement of professional, literary and
scientific knowledge in the Navy*

September, 1949

Edited by CAPTAIN W. G. COOPER, U. S. NAVY

Managing Editor—COMMANDER ROY DE S. HORN, U. S. NAVY (RET.)

Associate Editors

CAPTAIN JOSEPH M. P. WRIGHT, U. S. NAVY

COMMANDER C. P. LEMIEUX, U. S. NAVAL RESERVE (INACTIVE)

LIEUTENANT COMMANDER H. O. WERNER,
U. S. NAVAL RESERVE (INACTIVE)



United States Naval Institute

Publication Office: Menasha, Wisconsin

Editorial and Business Office: Annapolis, Maryland

Advertising Department: 2000 Connecticut Ave. N.W., Washington, D.C.

Copyright, 1949, by U. S. Naval Institute

Officers of the Institute

PresidentADMIRAL LOUIS E. DENFELD, U. S. NAVY
Vice-PresidentREAR ADMIRAL JAMES L. HOLLOWAY, JR., U. S. NAVY
Secretary-TreasurerCAPTAIN W. G. COOPER, U. S. NAVY

Board of Control

ADMIRAL LOUIS E. DENFELD, U. S. NAVY (ex officio)
REAR ADMIRAL JAMES L. HOLLOWAY, JR., U. S. NAVY (ex officio)
REAR ADMIRAL ELLIS REED-HILL, U. S. COAST GUARD
REAR ADMIRAL JOHN W. ROPER, U. S. NAVY
CAPTAIN ARLEIGH A. BURKE, U. S. NAVY
CAPTAIN M. A. SAWYER, U. S. NAVY
CAPTAIN ROBERT B. PIRIE, U. S. NAVY
MAJOR JOHN E. WILLIAMS, U. S. MARINE CORPS
CAPTAIN W. G. COOPER, U. S. NAVY (ex officio)

Past Presidents

ADMIRAL DAVID D. PORTER, U. S. NAVY, 1873
REAR ADMIRAL JOHN L. WORDEN, U. S. NAVY, 1874
REAR ADMIRAL C. R. P. RODGERS, U. S. NAVY, 1875-78
COMMODORE FOXHALL A. PARKER, U. S. NAVY, 1878-79
REAR ADMIRAL JOHN RODGERS, U. S. NAVY, 1879-82
REAR ADMIRAL C. R. P. RODGERS, U. S. NAVY, 1882-83
REAR ADMIRAL THORNTON A. JENKINS, U. S. NAVY, 1883-85
REAR ADMIRAL EDWARD SIMPSON, U. S. NAVY, 1885-87
REAR ADMIRAL STEPHEN B. LUCE, U. S. NAVY, 1887-98
REAR ADMIRAL WM. T. SAMPSON, U. S. NAVY, 1898-1902
REAR ADMIRAL H. C. TAYLOR, U. S. NAVY, 1902-1904
REAR ADMIRAL C. F. GOODRICH, U. S. NAVY, 1904-1909
REAR ADMIRAL RICHARD WAINWRIGHT, U. S. NAVY, 1909-11
REAR ADMIRAL BRADLEY A. FISKE, U. S. NAVY, 1911-23
VICE ADMIRAL WILLIAM L. RODGERS, U. S. NAVY, 1923-24
ADMIRAL HENRY B. WILSON, U. S. NAVY, 1924-26
ADMIRAL HILARY P. JONES, U. S. NAVY, 1926-28
REAR ADMIRAL EDWARD W. EBERLE, U. S. NAVY, 1928-29
ADMIRAL S. S. ROBISON, U. S. NAVY, 1929-31
REAR ADMIRAL M. L. BRISTOL, U. S. NAVY, 1931-33
ADMIRAL WILLIAM H. STANDLEY, U. S. NAVY, 1933-35
ADMIRAL DAVID FOOTE SELLERS, U. S. NAVY, 1935-37
FLEET ADMIRAL WILLIAM D. LEAHY, U. S. NAVY, 1937-40
ADMIRAL H. R. STARK, U. S. NAVY, 1940-42
FLEET ADMIRAL CHESTER W. NIMITZ, U. S. NAVY, 1942-43
FLEET ADMIRAL E. J. KING, U. S. NAVY, 1943-46
FLEET ADMIRAL CHESTER W. NIMITZ, U. S. NAVY, 1946-48

September

Vol. No. 75, No. 9

Contents

1949

Whole No. 559

For the Advancement of Professional, Literary, and Scientific Knowledge in the Navy

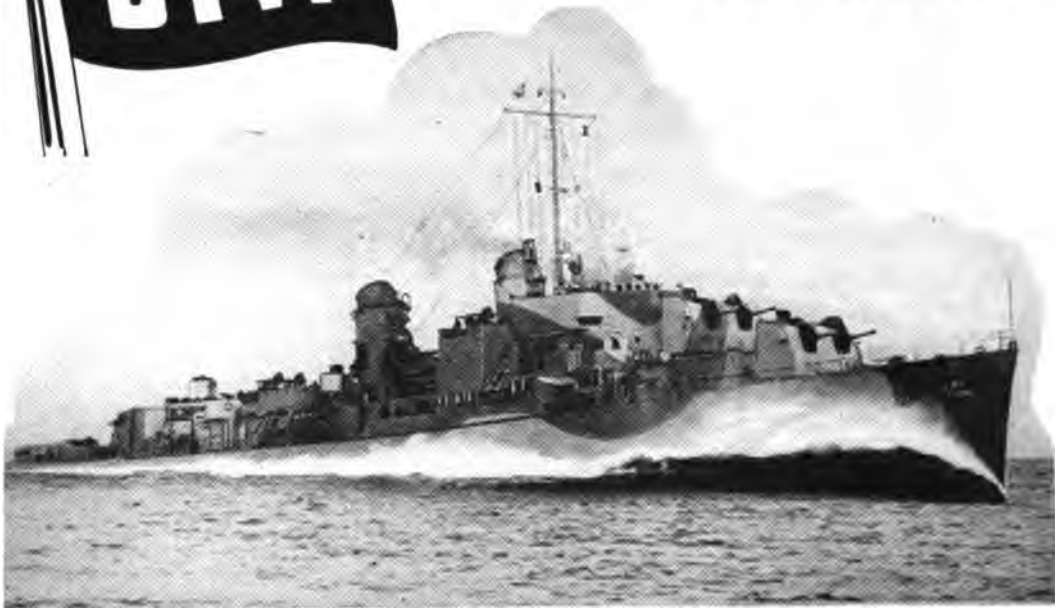
IN THE ANTARCTIC ICE PACK—THE SUBMARINE <i>Sennet</i> THREADING THE ICE FIELDS IN ONE OF THE U. S. NAVY'S ANTARCTIC EXPEDITIONS.	<i>Front Cover</i>
<i>Official U. S. Navy Photograph</i>	
A HISTORICAL EXAMINATION OF SOVIET FOREIGN POLICY.	973
By Lieutenant Leon B. Blair, U. S. Navy	
POTENTIALITIES OF ATOMIC WARFARE AGAINST THE U. S. PETROLEUM IN- DUSTRY.	983
By Commander Robert C. Wing, U. S. Navy	
HE WON THE GOLD DUST DERBY.	989
By Lieutenant Commander Andrew Hamilton, U. S. Naval Reserve	
SEVENTY-NINE MINUTES ON THE PICKET LINE.	997
By Lieutenant Commander Frank A. Manson, U. S. Navy	
MORE ABOUT THE "CASTE SYSTEM".	1005
By Edmund A. Gibson	
NAVAL EFFICIENCY.	1011
By Lieutenant (j.g.) Robert J. Massey, U. S. Navy	
THE NAVAL ACADEMY ATHLETE AS A NAVAL OFFICER.	1019
By Vice Admiral Carleton H. Wright, U. S. Navy, (Retired)	
THESE BOOTS WEAR SKIRTS.	1023
By Lieutenant Robert A. Rogers, U. S. Navy	
RADAR, COLLISIONS, AND THE RULES OF THE ROAD.	1029
By Lieutenant Commander Joseph K. Taussig, Jr., U. S. Navy	
LOW AND SLOW—MAKING SEAPLANE HISTORY.	1041
By Lieutenant Commander R. R. Boettcher, U. S. Navy	
THE COAST AND GEODETIC SURVEY (<i>Pictorial Section</i>).	1047
DISCUSSION, COMMENTS, NOTES.	1057
BOOK REVIEWS.	1061
PROFESSIONAL NOTES.	1067
SECRETARY'S NOTES.	1089

The opinions or assertions in the articles are the private ones of the writers, and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

Published monthly at 450 Ahnaip St., Menasha, Wis.
Executive, Editorial and Business Offices, U. S. Naval Institute, Annapolis, Md.
Advertising Department, Suite 710, 2000 Connecticut Ave., N.W., Washington, D.C.
Entered as second-class matter at the post-office at Menasha, Wis., April 4, 1922, and at the post-
office at Annapolis, Md., under Act of August 4, 1912. Acceptance for mailing at the special rate
of postage provided for in section 1103, Act of October 3, 1919, authorized March 13, 1922.
Membership dues (including PROCEEDINGS), \$2.00 a year.
Subscription rate, \$4.00 a year. (Foreign postage, \$1.00 extra.) Single copies 50 cents.



*the flag of
distinction*



**60 YEARS OF SHIPBUILDING
AND
MACHINE BUILDING EXPERIENCE**

5 Building Ways - Plant Acreage 50

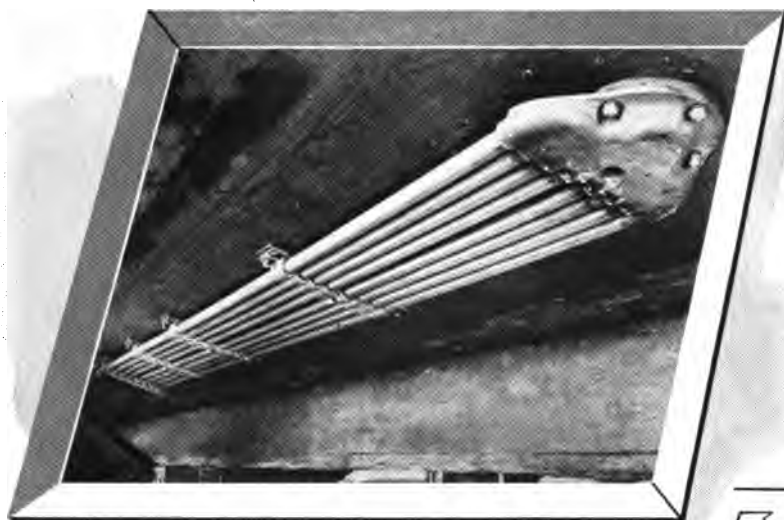
Modern Shops - Fast Crane Service

BATH IRON WORKS CORPORATION

SHIPBUILDERS AND ENGINEERS

BATH, MAINE





Two Outboard Cooling Systems that cut operating costs

"Closed" cooling systems help you get the most in service and economy from engines, especially where cruising waters are salt, debris-infested, or sandy.

But... unless your cooling system is adequately rustproof and corrosion-resistant, it can cause more trouble than it cures!

A good way to insure your closed outboard cooling system against expensive corrosive failures and rust fouling is to specify *Monel** tubing for under-water heat exchangers and inboard piping. For, in addition to being 100% rustproof and highly resistant to salt-water corrosion, *Monel* is *actually stronger than structural steel*... extra protection against under-water damage. *Monel* is galvanically neutral to the bronze through-hull fittings and return bends.

If you are considering the many advantages of fresh-water cooling for your own boats, remember this... a single lay-up for repairs may cost a great deal more than the small additional expense of dependable *Monel* protection.

Your local shipyard or boat builder will be glad to quote on rustproof *Monel* tubing for keel coolers; also *Monel* propeller shafts, fittings, and accessories. Why not investigate... soon?

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

Keel condenser of a Walter Clean-Flo Cooler, installed on the fishing boat, Ventura, of City Island, N. Y., owned by Capt. Sol Newman and partners. The tubing is strong, light-walled seamless Monel (1 1/4 in. O.D. with 0.065 in. wall). Fittings are cast bronze, secured to the wood hull with Monel bolts, nuts, and "K" Monel lock washers. Ventura's Monel propeller shaft has been in service for the past ten years. Her planks have been refastened with Anchorfast nails of Monel, driven between the old rusted galvanized fastenings.*

Walter Clean-Flo Coolers made by G. WALTER MACHINE CO., 84 Cambridge Ave., Jersey City 7, N. J.



A Monel-tubed keel condenser installed on the 45-ft. tug, Charles E. Gray, of Brunswick, Ga. Return bend and through-hull connection are bronze. The Charles E. Gray is also equipped with a rustproof, corrosion-resistant Monel propeller shaft, and Monel hull fastenings.

Cooling system fabricated from standard I.P.S. Monel pipe, and installed by BRUNSWICK MARINE CONSTRUCTION CORP., Brunswick, Georgia.



Monel*

EMBLEM OF SERVICE



"...It's the SEAGOIN'*metal"
Reg. U. S. Pat. Off.



Official U. S. Army Photograph

VLADIVOSTOK, RUSSIA'S OUTLET ON THE PACIFIC

Russia's early expansion was northeastward, through Siberia, and southwestward toward the Black Sea and Mediterranean, where weaker nations could offer little resistance.

UNITED STATES NAVAL INSTITUTE PROCEEDINGS

Vol. No. 75, No. 9

SEPTEMBER, 1949

Whole No. 559

A HISTORICAL EXAMINATION OF SOVIET FOREIGN POLICY

By LIEUTENANT LEON B. BLAIR, *U. S. Navy*

THE PRESENT period of post war disillusionment and petty quarreling in which the world today finds itself is not a peculiarity of this post war period alone. A similar situation has existed after every war. Today, however, we find a host of military, economic, scientific, and assorted miscellaneous experts belaboring, in press and by radio, Russia (or the U.S.S.R., Soviets, or Moscow—the names synonymously mean that nebulous frightening power somewhere in Europe or Asia, or both) as the cause of all our ills. Yet the people of the United States have little appreciation of what Russia is, or of what its history reveals.

The Union of Soviet Socialist Republics, to give it its proper name, is a federation of sixteen sovereign republics. The largest of these, Russia, occupies three fourths of the land mass of the federation and has two thirds of the population. The people of Russia were originally a blend of many races—the native Slavonic peoples, the Asiatic Huns and Tartars, and a Swedish people (Varangians) to whom the fact of a Russian people and a Russian State is attributable. The name "Rus," originally a Finnish description of the Swedes as "Rowers," was widely used as early as the tenth century to describe the peoples of what is now Russia.

Surrounding Russia is a belt of sovereign, in name at least, Soviet Republics. The frontiers are ethnic frontiers rather than

geographical. On the West are the Karelo-Finn Republic, the Baltic States of Latvia, Estonia, and Lithuania, White Russia, the Ukraine, and Moldavia, inhabited largely by Slavonic people ethnically related to the Russians. To the South are the Asiatic Republics of Georgia, Armenia, and Azerbaijan lying between the Black Sea and the Caspian, and of Kazakstan, Uzbekistan, Turkomen, Tajikistan, and Kirghiz lying between the Caspian Sea and China. All the rest, from the Gulf of Estonia to the Pacific Ocean, and from the Arctic Circle to the borders of India, is Russia. To call the Armenian a Turk is to call down upon one's head the maledictions occasioned by two thousand years of persecution, yet, in the main, the non-Russian people of the Southern Republics are Turkish. Perhaps a better description is simply "non-Slavic and non-Russian."

Russia itself is by no means an ethnic entirety. It contains 169 distinct ethnic groups. It contains seventeen autonomous republics, many of which are further divided into autonomous territories and regions. Several former autonomous republics and regions in the U.S.S.R. were liquidated during World War II as a result of the disloyalty of the populations, who found their national aspirations not satisfied and therefore collaborated with the invading Germans.

The Soviet Union, although actually a

EDUCATED AT Texas Technological College and Texas University, Lieutenant Blair was commissioned in the Naval Reserve in 1942 and transferred to the Regular Navy in 1944. During the War he served in aircraft squadrons in the Aleutians, Marianas, and at Iwo Jima. At present he is at Rice Institute in connection with the "Holloway Plan" Midshipman Training Program, and in addition is specializing in Military History.

product of Russian history, is regarded as a youngster in the community of nations, and it is a youngster as to political form. It is young in the life cycle of nations—"dynamic" is the word used by one geopolitician. It was estimated in 1944 that more than half of her people were under twenty-five years of age, yet the fact remains that there is little territory included in the U.S.S.R. that was not a part of the Russian Tsarist Empire. In many respects the expansion of the Russian Empire closely paralleled that of the United States. While warring with European neighbors, both nations expanded to the Pacific Ocean—the Russians into the lands of the Tajiks and Tartars, the Samoyeds and the Kamchadals; the United States, into the lands of the Seminole and Navaho, the Apache and Aleut. So goes the chronicle of "Russian Imperialism" and "American guidance of backward peoples."

Although the Soviet Union is a product of Russian history, Russian history is largely a result of geographical circumstances. It is a great plain with few natural frontiers, backed up against the frozen waste of the Arctic on the North, flanked by burning deserts on the South, cut off from the civilization influence of Rome by the warring tribes of Germany and Central Europe. Here about A.D. 852-62 a state was born, fathered by groups of Scandinavians led by Rurik, and peopled by native Chuds, Slavs, and Finns. The whole compass of the Russian lands at the beginning of their national history was slightly smaller than the Scandinavian peninsula. Within twenty years they had increased by half, inaugurating a policy of expansion which has continued to this day. During the tenth century, the new nation was, until converted to Christianity about 980, embroiled

in a series of wars with the Byzantine Empire, and upon several occasions penetrated the Bosphorus in its attempt to reach the riches of the Mediterranean. Finally, in A.D. 972, the Byzantines inflicted a crushing defeat on the Rus in a series of actions along the Danube River.

The peace of 972, followed by conversion to Greek Christianity, was practically final between Constantinople and the Princes of the Rus.

The conversion of the Russian people to Greek Christianity has been of considerable historical consequence. As they had previously rejected the claims of Judaism and Islam, so they now rejected the claims of Rome, thus cutting themselves off from the Western Christian world and, in particular, severing themselves from their brother Slavs of Polish stock. Into the cultural vacuum of the Russian state thus created poured the civilization of the Greeks with its system of laws, different church and richer alphabet; while the Western world adopted the simpler Roman alphabet. Europeans called the Russians strange, a race apart.¹

A third factor, the migratory habit of the Russian stock, everlastingly seeking new lands and making new settlements, is partially responsible for Russian history and Russian expansion. Generally speaking, however, the expansion of the Russian Empire from the Baltic Sea to the Bering Straits, and from the North Pole to India, was based upon a combination of the three elements: an autocratic centralization of authority, first spiritual as head of the church, later political as head of the state; geographical position in a vast plain with no physical frontiers, where

¹ The following quotation from *Russia, from the Varangians to the Bolsheviks*, by Beazley, Forbes, Birkett, is indicative of the depth of religious conviction of the Russians: "Holy Russia has been no empty phrase. Constantly one finds the religious element surprising one afresh by its depth, the ubiquity, and the subtlety of its action in Russian history. Constantly one has to recognize its power of accomplishing what nothing else can do. To take only one instance; it is the greatest of all factors in the creation of the autocratic empire of Moscow, in the absorption of all of the lesser Russian principalities and cities, in the deliverance of the country from the yoke of the misbelieving Musselman and the heretic Pole."

nsion was facilitated by a network of gable rivers with connecting tributaries; the migratory habit of the Russian le.

ne expansion of Tsarist Russia was not out incident. It was attended at every with the clash of arms. It was charac- ed by expansion in one direction, a re- , a waiting period, and change of direc- . The increasing military might of West- European nations made any appreciable nsion in that direction hazardous, so the sian expansion along its *western* frontiers me a policy of opportunism—watchful ing. The Russians were not averse to dshed, if necessary, to further that policy, e history of the western frontier of Rus- rom the first attack on Constantinople l this date has been one of marching ies. Russia, and her successor, the Soviet on, has five times approximated her pres- western boundaries; Russia was four s thrown back.

lthough Russian history antedated him ome five hundred years, it was Ivan the it (1462–1505) who united the various cipalities of Russia, subjugated the ars² who had, since 1224, overrun the es of the *Rus*, and, by marriage to the e of the last of the Byzantine Emperors, tified his family, race, and country as the essor to the claims of the Byzantine sire. It was Ivan the Great, who, in 1480, proclaimed *Tsar of all the Russias*.

an IV (the Terrible) inaugurated Rus- expansion into Asia. Faced more or less a stalemate in the west, and troubled estically with Cossack insurrections, offered Yermak, leader of one of the sack bands, as much free land as his band d take from the Mongol Khan. Fifty s later, the Cossacks were standing on shores of the Bering Sea looking at ka.

ne sees in Russian literature repeated

The Tartars, under the leadership of Jenghiz Khan, lished in the 13th century an empire extending the Pacific Ocean to the Black Sea. Of the Tartars selves, an ancient chronicle of Novogorod, A.D. says, "For our sins came unknown tribes. No one s exactly who they are, nor whence they came out, hat their language is, nor of what race they are, hat their faith is, but they call themselves Tatory."

reference to the Cossacks—Cossacks of the Don, Cossacks of the Dnieper, Cossacks of the Yaik—and yet the Cossacks, who added Siberia to the Russian Empire, are not a racial stock. They are a collection of discontented elements of many tribes, attracting recruits from the Christian North and Mohammedan South alike. People joined the Cossacks when the conventions of society became intolerable to them.

The Cossack expansion proceeded rapidly through the Tartar kingdoms of Kazan (1552) and Astrakhan (1555) to the very borders of China. Here on the Argun River, the Chinese halted the Cossacks, and the Treaty of Nerchinsk (1689) fixed that river as the eastern boundary of Russia. Respecting, for the time being, their treaty, the Russians turned northeastward, occupying the land of the Samoyeds and Kamchadals, crossing the Bering Sea, and by 1812, establishing settlements on the San Francisco Bay. The northeastward expansion was accomplished peacefully, no one being killed except some uncivilized natives, about whom no one cared very much.

The American phase of the Russian expansion appears to have collapsed of its own weight and distance from home. The settlements at Ross and Bodega, California, originally established to supply New Archangel (Sitka) and other Alaskan ports with grain, were sold to Captain Sutter in 1841 for \$30,000, and Alaska itself was sold to the United States in 1867 for \$7,200,000.

Shortly after the Treaty of Nerchinsk, although keeping her armies at a discreet distance, Russia began an economic and political penetration of Manchuria, meanwhile establishing settlements along the Amur River. Siberia had long since ceased to be solely a land of adventurers and exiles, and the need of an outlet to the sea for the increasing population began to be felt. In 1858 while China was engaged with the Taiping rebellion at home and engaged abroad in war with England and France, Russia imposed the Treaty of Aigun on her. Russia thereby gained all of the territory north of the Amur River, and the maritime region east of Ussuri River from the mouth of the Amur to the border of Korea. The aggressive interest displayed by the Russians in eastern Siberia

caused a Japanese statesman as early as 1873 to declaim, "Russia, always advancing southward, is the chief peril for Japan." Prince Ukhtomsky, during the reign of Nicholas II, urged "young men of enterprise, instead of fuddling their heads with European constitutions, to come out into Asia and rule the world." Japan checked the southward advance in 1904-05, by the decisive actions of the Russo-Japanese war.

The entire nineteenth century was one of feverish activity all around Russia's frontiers. Certain areas of the Caucasus, including Georgia (1801), Azerbaijan, and Armenia (1828) attacked by the Moslem Turks, appealed to the Tsar for protection, and were annexed to the Russian Empire. Russia's rebuff during the Crimean War (1854-1856) at the hands of Turkey, England, and France, resulted, as it had at other times, in great advances along the line of least resistance in Asia. In rapid succession, the rest of the Caucasus, including Kars and Ardahan (1878), which are even now being disputed between U.S.S.R. and Turkey, and the area east of the Caspian Sea (1874) were annexed. The central Asian advance was checked by the prior interest of Britain in India. Russian activities in behalf of Afghanistan led to the Afghan War of 1878-81 between Afghanistan and Britain. The treaty of peace established the Afghan boundary north of the Hindu Kush mountains, which Britain regarded as the natural frontier of India. In 1907, Russia agreed to regard Afghanistan as being outside her sphere of influence.

Russian statesmen claimed that the advance in Central Asia was in the interest of civilization, and that military subjugation of the native tribes was desirable and necessary to prevent their depredations on commerce. The path to civilization for natives was indicated by the Russian general, Skobelev, who had been sent to "absorb" the territory: "These people are a black spot on the earth. Their extermination would be a wholly virtuous act."

Influenced perhaps by cotton shortages due to the American Civil War, Russian armies captured Tashkent, the largest city in Central Asia, in 1865, and soon held all of the cotton producing areas of this "land of white gold"; it was named Russian

Turkestan. The irrigated lands were taken by the Russian officers. Murgabak, the best oasis in the region, became the Tsar's estate.

The cotton crop of Central Asia was tremendously increased under Russian supervision, but Central Asia no longer raised its own bread; that came from Russia.

Transition from Tsarist Russia to the present-day Soviet Union is not a difficult task. The Soviet Union is not a new nation. It occupies the territory of the Tsars, retains many of the national traditions of the Tsarist era, and in the words of Harrison Salisbury, former head of the United Press in Moscow, "there is not a line of Soviet foreign policy which any Tsarist foreign minister would not have underwritten twice over as the only basically sound policy for Russia. . . . What is Russian foreign policy today? It is the same as that of the Tsars, with one important difference—security. The conception of security is paramount in all Soviet relations with the rest of the world. And significantly, the first step Soviet Russia took toward achieving security was to get back the lands over which Imperial Russia once claimed sovereignty." The Russian quest for an ice-free port, first voiced by Peter the Great, and echoed intermittently since then as Russia expanded to Vladivostok (1858), and to Port Arthur (1897) is again raised as the Soviets currently demand preferential position in control of the Dardanelles. The age old "expansion into backward areas"—the territory of the Turkomens in 1866 and the territory of the Tannu Tuvans in 1946—is continuing.

Stalin and his colleagues, having at an early age learned the political facts of life, realize that they cannot continue to reap the fruits of a tree unless the tree itself is protected and nurtured. The agency that brought them to power, and by which, primarily, that power is maintained, is the Communist Party. It must be protected. Therefore the concept of security for the U.S.S.R. has been expanded to include, in addition to national security, security for the Communist Party wherever its branches might be. This divided concept of security on the part of the Soviet leaders is in a large part responsible for the distrust of the Soviet Union now existent. That distrust is not unilateral, nor is it new. The literary intelli-

gentsia of Moscow of one hundred years ago professed to find in Russia's history and the Russian national mind a type of socialistic civilization potentially higher than that of the individualistic Western Europe. They execrated Peter the Great's Europeanization of Russia as a deviation from the genuine course of Russian history. They wanted Russia to come back to the forgotten principles of the eastern church and state—orthodoxy and autocracy. If the emotional stimulus of Communism be substituted for the emotional stimulus of the Greek Orthodox Church, that appeal is as valid today as it was in 1850.

Thus we have the essence of Tsarist foreign policy—territorial expansion and economic development—plus security, projected into the present day. There have been breaks in the continuity of that foreign policy, during

the reign of Peter the Great (1672–1725), and during the foreign ministry of Maxim Litvinov (1933–1939), but the temporary breaks did not result in a reorientation of the basic policy.

The present impasse in Russian-American relations is new, however. Russian-American relations were pleasant once; both the Russians and Americans felt that Russia had the better of the bargain in the sale of Alaska to the United States, but there was little bitterness felt toward Russia as a result. The Treaty of Portsmouth (1905), terminating the Russo-Japanese War, was hailed in Russia as genuine evidence of our friendship; it occasioned considerable indignation in Japan, too, because of the relative smallness of Japanese gains after such a series of brilliant victories.

It is true that United States military in-



Official U. S. Navy Photograph

ANCHORED IN FORMER RUSSIAN TERRITORY

The U.S.S. *Indianapolis* anchored off Sitka, Alaska, before World War II. Sitka was the capital of the Russian Colony in North America before the United States purchased Alaska in 1867.

tervention in the Murmansk region and in Siberia during the Bolshevik revolution (1918 to 1921) provoked rather strained relations which were not reconciled until 1933. Despite that tension, however, the spirit of the peoples of the U.S.S.R. was overwhelmingly pro-American. The words, "po Amerikanski"—American style—was high praise. Wartime cooperation during World War II awakened a wholehearted admiration between the two peoples. Regardless of the feelings of the peoples of these two countries, both of whom profess the pursuit of Peace, Security, and Opportunity as primary objectives, the diplomatic relations have never been worse than at present. The phrase "cold war" has come into being to describe the conflict which is simply "War Without Weapons" or psychological warfare. It has as its objective, just as does the warfare of armies and navies, the destruction of the will to resist or to win. It achieves its objectives by breaking the moral and social cohesion of the opposing nation. Instead of using the appropriate combination of infantry corps, battleships, and P-38's, the "War Without Weapons" or "cold war" uses the appropriate combination of political, economic, and psychological weapons, supported with the threat of force if necessary to achieve its national policy. In Italy, Togliatti, by fomenting domestic strife and by threatening civil revolution, seeks to break the moral cohesion of the nation. Togliatti, then known as Ercoli, was a member of the Permanent Secretariat of the Executive Committee of the Third International until its dissolution in 1943. Other members, Dimitrov, Manuilevski, Pieck, Marty, Gottwald, and Pauker, upon dissolution of the Third International likewise took their places in the political life of their native countries, and have achieved great power there.

Stalin undoubtedly does not want a shooting war in the traditional sense, which, considering the geographical circumstances of the two countries, and barring the coming of some atomic, guided missile, push-button conflict, would be extremely difficult to wage. No one wants a war in which he at best could win only a pyrrhic victory. But who can deny that the Soviet Union has achieved by "cold war" her objectives in Poland and

Rumania with a positiveness equal to that of Hitler's *blitzkrieg*?

During the campaigns of Peter the Great, wars were fought by armies drawn up in a line; fronts seldom exceeded three miles in depth. During World War II, frontal zones embraced entire islands and large areas of national territories. Today, the Soviet Union wages her cold war over a frontal zone embracing the whole of Eastern Europe and Northern China. Nations and provinces are no longer of import. The strategic areas wrested from Finland in 1941, Estonia, Latvia, Lithuania, German East Prussia, Eastern Poland, Carpatho-Ukraine, Besarabia, and Bukovina, all in Europe, are no longer frontal zones. For them the war is over; they are conquered territories annexed to the victorious Soviet Union. In Asia, Kushka has been ceded to the Soviets by Afghanistan, and Tannu Tuva has been annexed.

The frontal zone envisaged by the Soviets is that area near enough to be amenable to the threat of Soviet military might. Those nations of the frontal zone not presently occupied are nominally independent, and in some cases actually independent; nevertheless, they are under strong pressure to put their armies, their secret police, and their foreign policy in the hands of Moscow-trained and directed experts. In this manner, a "friendly" government is insured—"friendly" being the approbation accorded those who are in accord with and actively support Soviet objectives.³

Within the European frontal zone, which at this time includes Poland, Eastern Germany, Czechoslovakia, Eastern Austria, Hungary, Rumania, Bulgaria, Yugoslavia, and Albania, a ruthless policy of persecution and terrorism was employed to bring friendly government into being. Thus in

³ Colonel General T. F. Shtikov, head of the Soviet delegation to the Joint Commission at its opening session, March 20, 1946, summed up the Soviet attitude toward its neighbors in his discussion of the destiny of Korea. He said, "The Soviet Union has a keen interest in Korea, being a true democratic and independent country, friendly to the Soviet Union, so that in the future it will not become a base for an attack on the Soviet Union." *The Voice of Korea, Korean Affairs Institute* (Washington, D. C.) April 6, 1946.

Bulgaria and Yugoslavia, opposition leaders were executed; in Poland, Rumania, and Hungary, they were exiled; in Czechoslovakia, Jan Masaryk "committed suicide."

In Asia, the frontal zone embraces North China, including Outer Mongolia, Manchuria, the Sinkiang Province, and Northern Korea.

Thus Soviet expansion is continuing. It differs from Tsarist expansion in that it is not regarded as imperialism (by the Soviets). The Soviet leaders call it "quest for security," yet the net effect of this new national strategy, using its political, economic, and ethnic weapons is the achievement of those objectives for which the Russian armies had been fighting for a thousand years.

In the Middle East and in Asia, where traditionally Russia was most likely to back up her territorial demands with guns, Turkey is under pressure to cede the Kars and Ardahan area to the Soviets. Kars and Ardahan, originally Turkish, were taken by Russia in 1878, and were lost back to Turkey during

the Bolshevik revolution. Mt. Ararat, tional symbol of Soviet Armenia, app on the Armenian coat of arms, lies in T Armenia next to Ardahan. The cry o dentism is loud.

In Persia, the Soviet Union is partic active. The population in North Pe ethnically kin to the southern Soviet publics. On the west, the Armenians posite the Armenian Soviet Republic Azerbaijan adjoin their neighbors Azerbaijan Soviet Republic; and the mens lie opposite Soviet Turkomen Persian, proper, does not come up frontier. His home is in middle and so Persia.

The Russians have always been go simulators, hence the weapon of ethnic tration has been a favorite of the R Empire and the Soviet Union. It prov zone of influence amongst kinsmen joining territory; it also encourages a tion of those kinsmen, lest the dome influenced by the foreign.



Official U. S. Navy Photograph

FOUR TIMES RUSSIA'S ADVANCE HAS BEEN CHECKED

Engagement in Chesme Bay between the Russians and Turks, July, 1770.

Today, we see the strategy of ethnic penetration at work all along the Soviet borders. In Persian Azerbaijan, for instance, the Soviets supported and encouraged a revolution which resulted in an autonomous state. They are now supporting the Kurds in their demand for autonomy, despite the fact that there are no Kurds in the Soviet Union. There are indications that Persia is a major Soviet objective. A weak national government, dissident elements of population, and enormous mineral resources render it a most propitious field for expansion. The Soviet Union has served official notice in unmistakable terms of her interests in Persia, charging "gross discrimination against the U.S.S.R. in voiding the 1946 oil concessions." It is "hostile activity . . . incompatible with normal relations between the two nations."

Newsweek reports, in a recent issue, "The Soviet industrial economy and military potential are suffering from lack of oil." Within Persia, the Communist Party, the *Tudeh*, has effectively furthered the Soviet policies. Jaafor Pishevari, a leader in the *Tudeh*, came to Persia from the Soviet Union where he had been employed by the Comintern.

To the east of Persia is Afghanistan whose Russian frontier is along the Oxus River. Rivers were never very good frontiers because of the tendency of an economy to develop on both banks of the river, and the Oxus is no exception. The ethnic frontier is to the south along the line of the Hindu Kush, a range of mountains running southwest-northeast. South of the range live the Pathans; to the north live the Tajiks and Uzbeks, who are kin to the people of Soviet Tajikistan and Uzbekistan. With the weakening of the British Empire, the Soviets have renewed their interest in Afghanistan, strengthening communications, and "rectifying borders."

Eastward along the frontier, in Sinkiang, we find again that the ethnic frontier and the political frontier do not coincide. The northern part of Sinkiang is a part of the Siberian plain, and the Turko-Moslem population flows over both sides of the political borders. Because the cities of Sinkiang are closer to the Siberian trade centers than to the Chinese, there is a tendency toward eco-

nomic collaboration between the former. The Soviets have capitalized on this fortunate geographic circumstance by construction of the Turk-Sib railway, and a motor highway to Urumchi, the capital of Sinkiang.

Outer Mongolia and Tannu Tuva, originally a part of the Mongol-Chinese Empire, and nominally under Chinese suzerainty, were detached from China shortly after the Bolshevik revolution by "Red Russian armies pursuing White Russian armies." They were organized as republics in 1921, and have remained independent since then, with Soviet troops in residence to insure that they remained independent. Tannu Tuva was incorporated into the Soviet Union in 1945; Outer Mongolia, because its economy is tied to that of Siberia, and because of the ethnic ties between the native Buryat people and the Buryats of Siberia, is for all practical purposes a part of Siberia.

In neither Manchuria nor Korea is the political frontier either the ethnic or economic frontier. In Manchuria, the political frontier is the Amur River; in Korea, it is the estuary of the Tumen River. In Manchuria, the Soviet Union has certain territorial concessions, and in addition, it is charged, are seeking a friendly government by supplying the Chinese Communist armies with arms and munitions. Penetration in Korea takes the form of support for the militant communist party.

Whether the Soviets will fight an orthodox war if checked in their "cold war" is unknown. It is, however, doubtful. Their present policy of opportunism is a comparatively recent one. If history could be turned back for the Russians to the early thirties, they would be welcomed into the family of nations (democratic) with open arms. The Russophobes who insist that the "Litvinov Policy" was a "front" are simply not supported by facts. Although there were disagreements between the U.S.S.R. and various other nations between 1933 and 1939, the whole tenor of Soviet foreign policy was one of cooperation, seeking collectively a peaceful and stable economy.

Stalin and Litvinov were aware of the covetous designs of their neighbors; the Tanaka Memorial was widely published in the Soviet Union. The Japanese plans for

Siberia were thus made known to the Soviet citizen. They knew, too, of Germany's aspirations in the Ukraine, and of her professed hatred for communism and for the Slavic people. Foreseeing the impending conflict, the Soviet Union sought closer cooperation with the democratic powers. Collective security, indivisibility of peace, universal disarmament, united front both with and within the democratic countries were among the most prominent features of Soviet foreign policy.

The year 1938 was a momentous one, for it witnessed the despair of the Soviet Union in achieving collective security. In March, Litvinov branded German seizure of Austria as a menace and declared that Russia was prepared to participate in measures aimed at checking further aggression; Britain rejected as premature Litvinov's proposal for a special conference to consider means of checking future aggression and eliminating an aggravated danger of a new world massacre. In September, 1938, the Soviet Union was excluded from the Munich conference, which sanctioned partition of Czechoslovakia in violation of Soviet-Czech, and British, French-Czech treaties. On August 23, 1939, Germany and the U.S.S.R. signed a non-aggression pact, and World War II was on.

Whether or not the Soviet Union is censurable for her policy of opportunism in 1939 is bound to be the subject of acrimonious debate for years to come. It is a part of her history, however, and the lesson is clear—the Soviet Union will pursue the line of least resistance in achieving her conception of "peace, opportunity, and security." She is prepared to play any card available at the time, and which promises maximum success in a given situation. This might be one day an international, the next day a national card; a conservative, or a revolutionary; an Orthodox, or a Mohammedan; a pan-Slavic, or a pan-Arabic card; the ends count more than the means.

The alternatives to the United States are clear—Meet the Soviet challenge, or get out of Europe and Asia; the unspoken corollary to "getting out of Europe and Asia" being, of course, that we abandon a goodly part of our foreign trade to the Soviet Union. Russian-Soviet history indicates that a shooting war will not be the result of meeting the challenge; that, indeed, a bold stand is the only effective way to insure peace—that a rebuff will bring a change in Soviet foreign policy. The change will probably be negotiation, in good faith, which will remove the principal obstacles to World Peace.



"NAVIGATION IS DANGEROUS IN THE ALEUTIANS"

Contributed by LIEUTENANT COMMANDER ROY C. SMITH, III,
U. S. Naval Reserve

Some years before the war one of the Coast Guard cutters patrolling in the Aleutian area was having great difficulty with her navigation through lack of sights in bad weather and uncertainty of the ship's speed indicators. Consequently the Exec-Navigator was using the ancient practice of dropping a chip over the bow and timing its progress to the stern in order to calculate his speed through the water.

One day as he went forward to drop the chip and start his race to the stern, a group of men gathered on deck around the ship's mascot, who was learning a new trick. The Skipper, on the bridge, seeing the Exec start aft and the group of men in his way, ran down from the bridge crying, "Look out for the Exec! Look out for the Exec!" The men cleared away, and the Skipper thought that he might as well clear the rest of the deck, too, so he kept on running aft crying, "Look out for the Exec!"

The cook, hearing all the commotion, stuck his head out of the galley to see what was happening. Observing the Captain in a mad race down the deck, followed by the Exec at a smart pace, and hearing the Captain's cries, he immediately assumed that the Exec had gone mad from too much Aleutians and was out of control. Seizing his rolling pin and timing the passage perfectly, he knocked the poor Exec colder than the proverbial mackerel!

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS.)



Courtesy Standard Oil Co. (N.J.) photograph by Rosskam

OIL WELLS IN THE SWAMP

Like many other oil fields, Choctaw Oil Field in Louisiana is too dispersed for likely attack by atom bomb. But the concentrated refineries would be top targets.

POTENTIALITIES OF ATOMIC WARFARE AGAINST THE U.S. PETROLEUM INDUSTRY

By COMMANDER ROBERT C. WING, *U. S. Navy*

THE ATOMIC bomb has by popular conception been conceded to be a weapon against which there at present exists no defense. Members of the general public carry the impression that the nation's possession of the atomic bomb will swiftly and easily prevail over any adversary. It is generally conceded that if both adversaries could possess the weapon, the inevitable result of its use would be the mutual destruction of each other's industries and of population.

In order to test against the U. S. petroleum industry this popular conception, it is herein attempted to apply publicly known facts concerning the atomic bomb's destructive power to equally publicly known facts concerning the United States petroleum industry. Necessarily, utilization of data will have been limited to that which is publicly known and classified. The destructive power of the atomic bomb was revealed at Hiroshima, and it is hoped that the assembly herein of general data and a logical application of this data to material published in petroleum industry journals will be considered sufficient for a generally conclusive survey regarding the potentialities of atomic warfare against the United States petroleum industry.

Utilization of the atomic bomb against the petroleum industry, by any foe, is severable into two distinctly different types of application. The first type of possible application would be against atomic bomb attacks directly against the petroleum industry facilities within the United States, and the second type of possible application would be against our harbors, which much of our petroleum in one form or another must necessarily move as it comes from foreign sources to the refineries in our country, or as it proceeds in the form of coastwise trade from U. S. oil

fields through the refining centers to the consumers.

Analysis of the potentialities of atomic warfare directly against the petroleum industry facilities within the United States necessitates exploring the nature of the target. Where are the production centers; where are the refining centers; what is the degree of concentration; and what is the trend?

Nature ages ago determined the location of crude oil, gas and natural gasoline. "Oil is where you find it," is an industry saying that recognizes the element of chance in finding oil. Production facilities must be concentrated over the subterranean deposits. During the present decade the great demand for petroleum products has intensified the development of existing fields through additional drilling to already developed production levels, and in many cases to deeper sands in the same field. The great market demand produces an economic pressure to obtain more and more oil in shorter time from our known fields, and this trend toward forced concentration of production facilities is likely to continue. Nevertheless, since there are literally hundreds of separate oil and gas fields and tank farms, the concentration in the production end of the petroleum business is not, and cannot, become so acute

A GRADUATE of the Naval Academy in 1935 and the Harvard Business School in 1939, Commander Wing served in the carrier *Saratoga* for several years, and during the war he commanded the *PC-1253*, the destroyer escort *Kretschmer*, and Atlantic Fleet Escort Division 6. Other duties have included service as legal officer on the Munitions Board and his present duty on the Munitions Board Petroleum Committee. In addition he has worked in South America for the Standard Oil Company of New Jersey, and in Cleveland for the Standard Oil Company of Ohio.

as in the refining end; nor is it concentrated in a degree that makes it subject to substantial disruption by atomic bombing attack.

In contrast with production facilities, refining facilities in the United States are acutely concentrated. In fact, most of our refining capacity is grouped in particular industrial sections of the East Coast in the New Jersey-Pennsylvania area, on the Gulf Coast in a few sections of the Louisiana-Texas industrial area, on the West Coast in a couple of the major industrial areas of California, and again on the mid-continent in a couple of the major industrial areas that are accessible to the Mississippi and its tributaries.

Refining of crude petroleum into finished products is a manufacturing process which is peculiarly adaptable to large scale operation. The process requires specialized and expensive equipment which is almost fully automatic in operation. As compared to other major industries, the manpower requirement for operation is small, although the skills required of the operators are very considerable. Virtually the only limitation to refinery size is the quantity of crude oil available to the plant and the size of the market available within the range of economical distribution.

In the United States eighteen oil companies own nearly three-quarters of the total refining capacity of the country. The principal refinery construction that took place during World War II was the building of 100 octane gasoline plants. Most of this was financed by industry, and some 80 per cent of all the wartime refinery construction was carried out by the eighteen companies that own the three-quarters of all our refinery facilities. It is, therefore, easy to understand why the wartime catalytic cracking facilities and other related structures requisite to the manufacturing of high octane aviation gasoline were built within the confines of existing refineries or adjacent to them.

The petroleum industry management is aware of the concentrated nature of the refinery facilities and the undesirable security aspects of this situation. Although an effort is being made to expand the smaller refineries before carrying on with further expansion of the big plants, and in this way

slow down some of the abnormalities of concentration, little possibility exists for the development of many new and diverse refinery locations. In a large measure, the industry is powerless to stem the trend. The economic laws are such that expansion through integration with existing facilities gives operating economies, lower cost in steel, manpower, utilities, and housing savings that cannot be achieved through the erection of completely new units. The short supply and high cost situation in steel, housing, skilled manpower, and the struggle for operating profits makes the trend for concentration virtually inevitable. The demand for all petroleum products has increased tremendously and additions are being made to existing terminals, both marine and inland. The same reasons which justified the original location of these terminals now justifies their expansion. Likewise, additional pipeline facilities are being expanded by looping and by the addition of pumping stations. Generally speaking, new pipelines to transport crude or products are built only when, for various reasons, the same results cannot be achieved by expanding existing facilities.

It may be comforting to say that no potential enemy yet possesses the atomic bomb, but we would, indeed, be living in a "fool's paradise" if we were to depend on that condition to exist for long. When war comes, and if with it comes the atomic bomb, the refinery industry because of its concentrated nature will be in an unenviable status if it is selected as a high priority target objective. It is unlikely that atomic bomb production can achieve, at least in our time, anything like mass production. Therefore, it will be used only against choice targets. The degree of concentration in the production and transportation end of the oil industry is not such as to provide choice targets. Mobilization centers, aircraft plants, shipyards, governmental and population centers are fore-ordained to be primary targets.

Will the petroleum refinery industry be a high priority target for an enemy possessed of a limited supply of atomic weapons? We have already seen that it is so extremely concentrated as to be highly vulnerable. Certain areas of concentration present unit targets of a high percentage of our total petroleum

industry refining capacity. Furthermore, no enemy will long overlook the industrial nature of the refinery surroundings. Effectiveness of an attack against the refineries may well be compounded through damage to surrounding industrial facilities, which in many areas are key industries. The Secretary of Defense has already publicly acknowledged before an open hearing of the Armed Services Committee of Congress that in the event of war we must have at least 2,000,000 barrels a day more product than the continental United States is capable of producing. At the peak of a raging war, at the time when our war planes and our warships, and our tanks, and all the myriad of petroleum powered tools of the American way of battle begin to cast the shadow of despair upon the foe he will not overlook the source of all this energy. The refineries are so logistically important that their destruction would be directly and immediately reflected on the field of battle. Destiny has it that the refining industry must face attack by atomic bomb, if war should come.

The amount of destruction that the atomic bomb could accomplish against us would depend upon the area selected, the number of bombs available for the operation, and the enemies' ability to place accurately such attacks. The effect of exploding an atomic bomb over the production units of a petroleum refinery must be based on theoretical and interpolated data inasmuch as oil refineries were not included in the devastated areas of Nagasaki and Hiroshima. The heavy steel in buildings at Nagasaki suffered severe damage from blasts alone over an area of 1.8 miles in diameter. An area of this size would be sufficient to cover the major production units of most refineries. The result is that the principal installations such as cracking coils, distillation units, and alkylation plants would be exposed to heavy and concentrated damage rather than the scattered and relatively easily repaired damage which resulted from World War II conventional bombs. It should be noted that the individual area of effectiveness of the atomic bomb is probably 5,000 to 15,000 times the area of effectiveness of the conventional bomb. The light steel characteristic of tank farm construction is such that the area of

structural damage to them would be at least two or three times that of refinery process units. Perhaps some surcease from anxiety here can be found in development of underground storage facilities.

Successful damage control requires that the effect of damage be arrested before the cumulative results of even minor destruction goes beyond the repair ability of damage control organizations. Complete destruction of industrial facilities by using the conventional bomb usually requires an extended campaign of numerous attacks. After each attack the interim respite provides an opportunity to control damage. On the other hand, use of the atomic bomb provides no opportunity for damage control operations during successful attacks because it apparently is so extremely destructive that one attack virtually annihilates the target area. The refinery damage control organizations probably will find that the atomic bomb creates almost unmanageable destruction.

Before proceeding with an evaluation of the effectiveness of atomic warfare against our harbors and the results upon the operations of our petroleum industry, it is necessary to present some aspects of the needs of the petroleum industry for use of the ocean highways and of United States harbor facilities.

Prior to World War II, 95 per cent of the petroleum used on our East Coast involved transportation by tankers. During the war tankers carried only 22 per cent of the load after completion of the Big and Little Inch pipelines. Today, the position again is more nearly that of pre-World War II. Statistics for the year 1945 show that approximately one million short tons of crude and finished products, amounting to roughly 7,000,000 barrels, were moved daily by tanker in and out of our ocean terminals in domestic and foreign trade. The amount moved today, due to certain market recessions and post-war changes in the export-import pattern, is about one-half million short tons per day, amounting to about 4,000,000 barrels. However, in event of emergency this slack would disappear, and the actual movements would approximate or surpass the 1945 movements.

As previously stated, the Secretary of Defense has acknowledged that the United States needs for petroleum in an emergency

are 2,000,000 barrels per day above the now predictable production capacity within the continental United States. This astounding figure is 34.5 per cent above current United States production capacity which until recently has been straining to the ultimate and currently striking an all-time high. If we can succeed in time of war in maintaining access to foreign sources, our war machine will want to take from those areas 2,000,000 barrels per day which is not available in our own country. Add this import requirement to the 7,000,000 barrels per day in 1945 moved daily by tanker in and out of our ocean terminals, and it can be readily understood how vital our harbor facilities are to the operation of the United States petroleum industry.

The problem of whether or not the sea lanes will be kept open so that tankers may actually reach the harbors is beyond the purview of this article since it is not considered a matter of atomic warfare. There have been acknowledged technical developments in aerial and submarine warfare that present

grave defensive problems. The advent of the Schnorkel submarine and the fast underwater submarine unquestionably poses a dire threat to our maritime lifelines. Undoubtedly the defensive technique against these modern submarines is under constant high priority study. However, whether or not our harbors will be available for use once the seas are successfully traversed is definitely related to developments in atomic warfare.

What is the possibility of atomic warfare against our harbors, and what effect would it have on our ability to import needed supplies? Most United States ports are unique because of their tremendous size. For example, the port of New York has 770 miles of waterfront, of which only 350 miles are developed. When we consider the fact that one atomic bomb can destroy steel frame buildings only within an area of four square miles, it can be seen that a tremendous number would be needed against this one port alone. Even if an aggressor were to possess the weapon in quantity, the cost to destroy completely as a harbor a port such as New York



Photograph of Percy Loomis Sperr

THE GREATEST SEAPORT IN THE WORLD

What would be the result if an atom bomb were dropped into this bottleneck of teeming ocean traffic?

would be fantastic.

The effect of the air blast damage rendered by atomic weapons against our ports would be of the same type, although much more intense than the damage rendered against the ports of our enemies by conventional bombing in World War II. If the blast occurred under water, additional damage would be caused by tidal waves and by radioactivity. The employment of a large number of atomic bombs on a port probably would produce enough radioactivity to force the evacuation of the area.

The United States has approximately 62 major ports capable of handling an estimated 18,000,000 long tons per month of dry cargo under normal working conditions. This capacity could be increased to an estimated 25,000,000 long tons per month by the more effective use of lighterage and the more intensive use of alongside facilities to reduce the turn-around time of vessels. At present, less than 50 per cent of our potential port capacity is being used. With particular regard to petroleum, approximately 30,000,000 short tons of petroleum and its products per month were moved into and out of our Atlantic, Gulf, and Pacific ports in 1945. The unused and expandable capacities represent a cushion that can be used to absorb much of the effect caused by an atomic weapon attack. Also, the use of alternate ports should

permit to a great degree the continuation of effective movement of essential shipping, and if the worst should come tankers can be anchored offshore and floating lines used to carry on loading or discharge. The problem is comparable to the experience of World War II from which was evolved the art of movement of supplies over beachheads, through improvised harbors, and through destroyed areas. Should the occasion arise, it is reasonable to conclude that an even higher degree of success in making landings on our own shores can be expected.

In conclusion, it must be admitted that the highly concentrated nature of the U. S. refining industry is such that it is vulnerable in a major sense to atomic warfare, and that it is a choice target susceptible of classification by the enemy as a target objective of high priority.

As for our harbors, they are of such great size and numbers, and the use of alternate ports and expedencies in loading and discharging tankers is so readily available, that even the atomic bomb is not likely to do more than cause temporary closing down of a given port or portions thereof, or disruptions in petroleum handling. The net effect on tanker operations or other aspects of petroleum distribution will not be sufficiently substantial to critically hinder oil industry operations.



"CAN YOU SEE THE MINE?"

Contributed by LIEUTENANT EDWARD U. O'DONNELL, *U. S. Naval Reserve (Inactive)*

One morning our PCS was ordered to leave its ASW station on the picket-line encompassing Anguar and Peleliu islands and report alongside an LCI staff vessel. Earlier, two successive sightings of a Jap sub had indicated that it was standing in towards the coast, probably to enter Schoniam harbor, a circular body of water one mile in diameter and giving access to the northwest reaches of the Palau group.

Closing the LCI, we were ordered to follow astern, enter the narrow channel as yet unswept by our minesweepers, and conduct an ASW sweep in the harbor. The Commodore riding the LCI called out a final warning: "There's a large mine in the channel entrance, so keep it well to port!" (The channel was all of 50 yards wide at the entrance!) Seeing a gloomy look on my face, he added cheerily: "Don't worry. I've stationed two men in a small boat over the mine so you'll know its position."

We came to GQ, and after water-tight security was set, all depth charges temporarily on "safe," and all personnel ordered clear of the forecastle and in life-jackets, we commenced to stand in gingerly. Sure enough, there was the small boat. We edged to starboard as much as possible in the narrow un-buoyed channel and finally passed abeam of the small boat.

I hailed these intrepid men sitting over a mine so that we might be safe, "Can you see the mine?" "Oh no, you passed near, it, about three shiplengths astern!"

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS.)



From an old print.

MONTEREY, THE CAPITAL OF CALIFORNIA, IN 1845

It was from Monterey that the official report of gold originated, starting a cross continental race between the Army and Navy to reach Washington first with the dispatches.

HE WON THE GOLD DUST DERBY

BY LIEUTENANT COMMANDER ANDREW HAMILTON, *U. S. Naval Reserve*

LIEUTENANT EDWARD FITZGERALD BEALE of the U. S. Navy should be as famous as Paul Revere, who warned that the British were coming, or Lieutenant Andrew Rowan, who carried that famous message to Garcia. But Beale had no Long-fellow to write "Listen, my children, and you shall hear of the midnight ride of Paul Revere," no Elbert Hubbard to publish in a score of languages "Rowan . . . there is a man whose form should be cast in deathless bronze."

The forgotten man of American history, Lieutenant Beale won a gruelling cross-continent race just 101 years ago to deliver to the Atlantic seaboard the most electrifying news of the last century—the discovery of gold in California. Details of that hair-raising exploit, unfortunately, lie hidden among the yellowed columns of century-old newspapers and on the brittle pages of official documents in the National Archives and the Library of Congress.

Lieutenant Beale reached the end of his 4,000-mile journey on a muggy Saturday evening, September 16, 1848, in Washington, D. C. He was 26 years old then, sun-browned, square-jawed, an acting lieutenant in the U. S. Navy.

In his scuffed saddlebags he carried two sets of official dispatches. One was for the Secretary of State from Thomas O. Larkin, United States consul at Monterey, California. The other was addressed to the Secretary of the Navy from Commodore Thomas ap Catesby Jones, commander-in-chief of the Pacific squadron. But what was to make people in Washington, Philadelphia, and New York gasp with amazement was a small vial of gold, the first tangible evidence to give credence to the astonishing rumors that had been rippling out of California.

Beale, who later was to play an important, if not widely known, role in the development of the West, had spanned the North American continent by native schooner, horseback, and sloop-o'-war in the incredible time of 47

days to set a new record. He had bested a rival Army dispatch bearer by more than a month. His dispatches and gold samples opened a thrilling new chapter of American history.

Somehow the drama of this Army-Navy gold dust derby has been neglected by historians and novelists alike. Beale is more often remembered as the "Hero of San Pasqual," when he and Kit Carson stole through Mexican lines in July, 1846, to summon aid to a besieged General Kearny. This bit of heroism is quoted by the same historians who overlook his key role in carrying the official news of California gold. As a matter of fact, the Army courier is sometimes given this credit. But there is evidence to show that it was Lieutenant Beale, the Navy officer, not his Army rival, who arrived in Washington first. And the story has a satisfyingly romantic ending in that Beale had a jeweler fashion half the gold into a wedding ring for his fiancée.

"Ned" Beale, a handsome, husky young man, was descended from seafaring folk on both sides of the family. His father was a Navy paymaster who served under Macdonough in the Battle of Lake Champlain. His mother was the daughter of the famous Commodore Truxtun of the *Constellation*.

As a youngster in Washington, D. C., young Ned grew up in an atmosphere of bitter politics. One day he and a lad named Evans attempted to settle a political question with their fists. As the boys swung at one another, a tall figure strode between them, grabbed young Beale by the collar and demanded; "What's this all about?"

A GRADUATE of the University of California at Los Angeles, during World War II Lieutenant Commander Hamilton served as a public information officer on the staff of Admiral Nimitz in the Pacific. At present he is manager of the Office of Public Information at the University of California, Los Angeles.

Breathlessly Ned answered that he was for Andrew Jackson, and that Evans had expressed a low, unseemly opinion of the President's opinions and personality.

"I am Jackson," said the tall man. "I never forget men who are willing to fight for me. Of course I do not want them to do it all the time."

Several years later President Jackson appointed the 14-year old youth a midshipman in the Navy. He was soon ordered to the *Independence* in Philadelphia. Beale's mother made him a wonderful blue coat with the great polished buttons of the immortal Truxtun, five times as large as buttons then in style. During his first day aboard the school ship, young Beale again got into a fight, this time over his coat. His physical courage and loyalty were two attributes to mark his entire life.

In 1845, Beale was sent with secret dispatches to Commodore Stockton who was en route to California in the *Congress*. This was the beginning of a career of message-carrying which was to take the young naval officer to England, the Sandwich Islands, and across the continent many times; to develop a close friendship with the great Kit Carson; and finally to bring about Beale's selection to carry the first official news of the California gold discovery.

Although gold had been picked up in small amounts for many years in California and the brown-robed Franciscan missionaries are said to have known of its existence, the official discovery of gold is credited to James Wilson Marshall. Helping Captain John Sutter build a sawmill near Sacramento, Marshall noticed yellow flakes in the mill race on January 24, 1848. The secret remained closely guarded for about six weeks, but soon the news began to leak. Many San Franciscans remained skeptical until Sam Brannan, a newspaper editor who had just returned from the mines, ran through the streets holding aloft a bottle of glittering particles and bellowing at the top of his lungs, "Gold! Gold! Gold! From the American River!"

As far as can be determined, the first printed account of the discovery appeared in the San Francisco *Californian* on March 15, 1848:

GOLD MINE FOUND—In the newly made raceway of the Saw Mill recently erected by Captain Sutter, on the American Fork, gold has been found in considerable quantities. One person brought thirty dollars worth to New Helvetia, gathered there in a short time. California, no doubt, is rich in mineral wealth, great chances here for scientific capitalists. Gold has been found in almost every part of the country.

This original announcement was followed on April 1, 1848, by a booster edition of the California *Star* which, even then, extolled the salubrious climate and the fruitful land. On an inside page the discovery of gold was casually mentioned. Approximately 2,000 copies of this edition of the *Star* were sent to the Mississippi Valley by mule team, delivery "guaranteed in sixty days." One copy evidently found its way to New York for the *Herald Tribune*, in its August 19, 1848 edition, presented an article closely paralleling the *Star* story. Considerable suspicion exists that a skillful *Herald Tribune* desk man re-wrote the *Star* article.

These three newspaper yarns, plus word-of-mouth rumors and personal letters from friends, set the East coast a-buzzing. It was declared on good authority that a group of sailors in San Francisco had deserted their ships and had earned from \$2,000 to \$5,000 apiece in a few days digging at the mines. A man named Wilson is said to have found \$2,000 in gold dust "almost in his backyard." Three Frenchmen removed a stump in the road and found \$5,000 in dust and nuggets in the cavity left by the roots.

Were such stories true? Had gold really been discovered in California? Or was this just another of the will-o'-the-wisps that had danced tantalizingly before the name of California for more than three centuries?

Top-ranking Army and Navy officers in California, which had just been wrested from Mexico, decided to find out and report to their superiors in Washington, D. C. If a rich gold strike had been made, this land of long seacoasts, vast inland valleys, rugged forests, sky-touching mountains, and formidable deserts might be worth many times in value what the Mexican War had cost.

One of the Navy's special agents in California at that time was Thomas O. Larkin, also United States consul at Monterey, then

the capital of the territory. He had lived in California since 1831 and his word and judgment were considered to be reliable. On June 1, 1848, he sat down and wrote to the Secretary of State:

Sir . . . I have to report to the State Department one of the most astonishing excitements and state of affairs now existing in this country, that perhaps has ever been brought to the notice of the government. On the American Fork of the Sacramento and Feather Rivers, another branch of the same, and adjoining lands, there has been, within the present year, discovered a placer, a vast tract of land containing gold in small particles. This gold, thus far, has been taken on the bank of the river, from the surface to eighteen inches in depth, and is supposed deeper, and to extend over the country . . .

I have seen several pounds of this gold, and consider it very pure, worth, in New York, seventeen to eighteen dollars per ounce . . . I shall within a few days visit this mine and make another report to you . . .

Larkin subsequently visited Sutter's Ranch and upon his return wrote, on June 28, 1848, a much more complete description of the mines and how the discovery had affected California. He added:

I have the pleasure of enclosing a paper of this sand and gold which I, from a bucket of dirt and stones, in a half hour, standing at the edge of water, washed out myself. The value of it may be two or three dollars.

Larkin's dispatches were sent via Navy mail from Monterey to La Paz, the little Mexican seaport town near the tip of Lower California. La Paz then served as a base for the Pacific Squadron, commanded by Commodore Thomas ap Catesby Jones, a crusty old sea dog who had seen considerable action at the Battle of New Orleans.

A short while previously, Beale had been attached to Commodore Jones' flagship, the *Ohio*, as an acting lieutenant. According to Stephen Bonsal, Beale's only biographer, the young naval officer was a talented cartoonist. One day he put on paper a caricature of the Commodore telling the ship's doctor a long-winded story about the capture of New Orleans. Commodore Jones heard about it and ordered Beale detached from the *Ohio* to command a company ashore at Mazatlan. Bonsal writes, "some of the offi-

cers saw in Beale's subsequent selection to carry dispatches and news of gold across Mexico further evidence of the Commodore's hostility."

But there is valid reason to believe that Commodore Jones was well aware of the historical importance of Larkin's dispatches. In fact, one of his letters to the Secretary of the Navy stated that Beale had "volunteered" to cross the country "at his own expense." But the salty old commodore, after "a little reflection and considering the nature of those communications," decided to send Beale to Washington, D. C., as a special Navy courier instead of trusting the slow and uncertain regular mail.

Late in July, 1848, Commodore Jones called Lieutenant Beale into his cabin aboard the *Ohio*.

"I'm ordering you to Washington with Larkin's dispatches," he said. "How soon can you leave?"

"At once, sir," Beale replied with a grin.

"Good! Colonel Mason of the Army is planning to send a courier also. Never let it be said that the Army beat the Navy in anything. I've picked you for this job because you're as much at home on the trail as the teakwood deck. In fact, I sometimes think you're a blasted landlubber at heart. What about some gold to take back with you?"

"I already have some dust and nuggets of my own that I traded for quinine."

"Excellent. You will shove off as soon as the flag secretary has completed my dispatches to the Secretary of the Navy. And remember this: get to Washington, D. C., before that Army courier!"

Highest-ranking Army officer in California during that summer was Colonel Richard B. Mason, who was also acting governor of the territory. Like Larkin, he had made a special tour of the Sacramento Valley and was preparing to send to Washington Lieutenant Lucian Loesser of the Third Engineers. Lieutenant Loesser was to carry not only Colonel Mason's dispatches, but also a tea caddy containing 16 samples of gold from various mines and \$3,000 worth of dust purchased with Army funds.

Lieutenant Beale got off to a head start on August 1, 1848. He laid out a 1,000-mile

course straight through the heart of Mexico. It meant crossing two great mountain ranges and the jungles of the *tierra caliente* on both coasts. But it was the shortest and fastest route. At Vera Cruz, he planned to catch a fast ship for an American port. Lieutenant Loesser was delayed until August 17 when Colonel Mason completed his report. The Army courier determined to take a ship to Panama, cross the isthmus, and then continue by water to Washington. Thus we find the paradox of the Navy officer travelling a good part of his journey by land, the Army officer almost all the way by sea.

It took Beale five days to cross the Gulf of California from La Paz to the Navy's auxiliary base at Mazatlan. There he hired a small native *goleta* to carry him 150 miles down the coast to San Blas where his inland trek would get under way.

When the Mexican governor of San Blas heard his plans, he said to Beale, "*Señor*, an American like yourself could not travel a dozen miles in Mexico without being robbed and murdered."

"Why?" asked Beale.

"The troops of Mariano Paredes have deserted and turned bandit. These *ladrones* are desperate, *señor*, and would not hesitate to kill you for the horse you ride."

But Beale knew that risks had to be taken. He set about to make himself look as much like a Mexican as possible. Years on the sea and the desert had browned his face the color of saddle leather. To complete the disguise, he bought a red flannel shirt, a sombrero, four six-barrelled revolvers, and a bowie knife to slip in his boot.

Beale and a Mexican guide left San Blas on August 12 to cross the rain-swollen *barrancas* en route to Tepic. They were held up once by three highwaymen. But Beale's six-shooters blazed and the bandits fled. Recognizing the possibility that he might be killed before reaching Washington, the first thing Beale did upon arrival in Tepic was to open his dispatches, make copies and mail them to the American minister at Mexico City.

This taken care of, Beale pushed on, with Commodore Jones's admonition ringing in his ears, "Get to Washington, D. C. before that Army courier." He and the guide rode

day and night, pausing only long enough to snatch momentary sleep when a fresh horse was saddled. On the outskirts of Guadalajara, just before dusk one night, they encountered another group of mounted men.

"These are bad men, *señor*," said the guide. "There are too many of them for us to fight."

"Right," said Beale. "You lead the way and I'll follow."

They touched spurs to their horses and galloped in the opposite direction. Bullets whined through the gloom, but none found their mark. Later Beale and his guide doubled back to the trail and found the ground stained with fresh blood. A party of eleven men, they were told afterwards, had been murdered by the gang.

From Guadalajara to Mexico City, the greatest threat to the young American Navy officer and his faithful Mexican guide was a raging tropical storm that pelted down in all its fury. The two swam swollen streams, rode around uprooted trees, dodged avalanches of rocks and mud, and picked their way at night by vivid flashes of lightning.

Eight days out of San Blas they reached Mexico City, a distance of 725 miles, literally caked in mud. If there had been a lingering doubt about Beale's resemblance to a Mexican, it had been dissipated long ago. He was not recognized when he stumbled into the courtyard of the American Legation in Mexico City, but his credentials proved who he was.

"You must stay here until you're rested," Nathan Clifford, the American minister, insisted. "A hot bath, clean clothes, and good food are what you need. While you're resting, I'll prepare my own dispatches for the Secretary of the State which I hope you will be so kind as to include in the official pouch."

On the morning of the third day, chafing at the time lost, Beale and his guide were again in the saddle, galloping toward Vera Cruz. This was easier going and, as Beale retraced Cortez' old route of march, he made the astonishing time of 275 miles in 48 hours, pausing only 10 minutes at a time for sleep and new horses. He met with *ladrones* only once during this stretch of the journey and escaped by riding down the face

of an almost unscalable cliff.

When the pair reached Vera Cruz, the mind of the Mexican guide had become almost unhinged by the dangers and vicissitudes of the perilous journey. He had to be returned to Mexico City under guard.

Four days after Beale arrived in Vera Cruz, he found transportation to the United States in the sloop-of-war *Germantown*. It was a tedious and uninteresting cruise north, and Beale paced the decks in his impatience. But finally the ship reached Mobile, Alabama.

From Mobile to Washington, D. C., Beale travelled by stage-coach. Word of his daring dash from California preceded him like a quickening wind before a rain. At each town and hamlet that he passed through, crowds turned out to cheer him, to inquire about El Dorado, and ask to see the gold samples.

On September 16, just 47 days after he had left La Paz, Lieutenant Beale reached Washington, D. C.—a new cross-continent record. He presented his official dispatches to the Secretary of the Navy and the Secretary of State. Senator Benton of Missouri, an old friend, and Senator Foote of Mississippi, who had travelled part of the way to Washington with him, jointly introduced the young naval officer to the Senate. Before the assembled legislators he recounted the discovery of gold in California and his trip East with the news.

As the Senate listened in rapt attention, Beale told of the rich gold strike in California and how it had affected the lives of every man, woman, and child in the territory. He recounted how whole towns were being deserted as mechanics, storekeepers, carpenters, blacksmiths, and newspaper compositors left for the mines. Soldiers and sailors were deserting in large numbers.

"There is danger that California may starve because even the farmers have gone crazy with the gold fever," he said. "And when more gold-seekers pour into California, the shortage of food will be even more serious. Would it not be profitable to send cargoes of flour, biscuit, and pickled meat 'round to the Pacific coast?"

Because the gold he had brought was his own, Beale carried it with him. He was besieged by friend and stranger alike to be

allowed to heft the nuggets and finger the dust. When he visited Henry Aspinwall in New York City, crowds followed in the street and begged to see the yellow metal. Even that wily old showman P. T. Barnum, who knew a good thing, wrote to Lieutenant Beale from Philadelphia begging for permission to exhibit the California gold:

Mr. Harding of the *Enquirer* has just informed me that you have in your possession an 8 lb. lump of California gold. As I am always anxious to procure novelties for public gratification I write this to say that I should be glad to purchase the lump at its valuation if you will dispose of it and if not I should like to procure it for exhibition for a few weeks.

Beale, who loved the mountains, the desert, and the sea, soon tired of all this hullabaloo. He refused Barnum's request, gave half his gold to the U. S. Patent Office in Washington, D. C., and had the rest wrought into a wedding ring for his fiancée and childhood sweetheart, Mary Edwards, daughter of Congressman Samuel Edwards of New Jersey. They were married in Chester, Pennsylvania, shortly afterwards.

Meanwhile, public attention had focused on Lieutenant Lucian Loesser, who arrived in Washington about the middle of November. The Army's courier had waited impatiently in Monterey for the *Lambayecana* until August 30, 1848, and had sailed with her to Payta, Peru. There he had transferred to another vessel which took him back to Panama where he crossed the isthmus to Colon and caught a third ship bound for New Orleans.

There were still many doubters. "It glitters, it looks like gold, but it isn't," the skeptics said. They were put to complete rout, however, when President Polk, in his message to Congress on December 5, 1848, gave official recognition to the discovery of gold in California:

The accounts of the abundance of gold in that territory are of such an extraordinary character as would scarcely command belief were they not corroborated by authentic reports of officers in the public service, who have visited the mineral district, and derive the facts which they detail from personal observation. . . . The officer commanding our forces in California visited the mineral district in July last, for the purpose of obtaining

accurate information on the subject. His report to the War Department of his examination, and the facts obtained on the spot, is herewith laid before Congress. . . . Information received from the officers of the Navy and other sources, though not so full and minute, confirm the accounts of the commander of our military force in California. . . .

The lid was really off. California was the golden magnet that drew adventurous men and women from all parts of the globe in the greatest gold rush that history has ever known. They headed west on foot, in covered wagons, and in sailing vessels. Thousands of them, intending to make a quick fortune in California, settled down to build a new state. In the year 1850 more than \$41,000,000 in gold was dug and washed out of California soil, followed by \$75,000,000 in 1851 and \$81,000,000 in 1852.

Lieutenant Beale remained in the Navy until 1852 when he resigned his commission to join the firm of Stockton-Aspinwall, which held large investments in western mining,

real estate, and transportation. Later on he was appointed Superintendent of Indian Affairs for California and Nevada, and developed a policy toward the Indians which endures today. In 1856 he sold Jefferson Davis, Secretary of War, on the scheme of importing camels from North Africa to use in the Southwestern deserts. He was appointed General in the Army and later U. S. Minister to Austria by an old friend of California days, President Ulysses S. Grant. He acquired the Fort Tejon ranch near Bakersfield, and became one of California's largest landowners.

But in the later years of his rich and useful life, Edward Fitzgerald Beale always dwelt lovingly upon the days when he was the Navy's No. 1 courier. He liked to be known as the man who carried news of the discovery of gold to Washington, D. C., and won the Army-Navy gold dust derby. History has not yet seen fit to bestow such distinction upon him.



MORE THAN LUCK

Contributed by LIEUTENANT SANTOS V. SHIELDS, *U. S. Naval Reserve*

The broad inviting entrance to the harbor of Espiritu Santo had been thoroughly and efficiently mined shortly after American forces had taken possession of the island. It can well be imagined the consternation and anxiety of shore personnel as an old four stacker steamed serenely into the mine field separating it from the inner harbor. The alarm was sounded, lights flashed and radio messages tried valiantly to warn the visitor of his imminent danger.

The destroyer either did not recognize or chose to ignore all signals. The air was tense as harbor duty officers alternately prayed and cursed the intruder through. And through he came, unscratched.

With evident relief, a message was relayed to the destroyer, "You have just passed through our mine field."

Came back the reply,
"We know. We laid it."

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS.)

WE IMPROVISED

Contributed by LIEUTENANT EDWARD U. O'DONNELL, *U. S. Naval Reserve (Inactive)*

While escorting an ammunition laden LST convoy from Eniwetok to Pearl Harbor, the patrol vessel on which I had duty had her radar conk out. The leading radarman reported to the bridge that a small motor in the set had burned out. No spares were available either on board or from the other escort vessels.

In fifteen minutes our radarman had solved the problem by improvising: he requested and received permission to dismantle one of the wipers mounted on the pilot-house ports. He transferred the motor from the wiper to the radar, and the day was saved.

(The PROCEEDINGS will pay \$5.00 for each anecdote illustrating the improvisational power and ingenuity of our naval personnel which is submitted to, and printed in, the PROCEEDINGS.)

Those Amazing U. S. Submarines

DID YOU KNOW

That MacArthur said, "I will return!", but the U. S. Navy's submarines *never left* the Philippines.

That American submariners are credited with shooting down a Japanese torpedo bomber at Pearl Harbor.

That the first enemy warship ever sunk by a U. S. submarine was a Japanese submarine torpedoed off Midway.

That U. S. submarine raiders were operating off the coast of Japan within a few days after war was declared.

That the Japanese started the war with a torpedo far superior to the American, but American subs soon proved far superior to Japanese.

That U. S. submarines participated in every major operation and sea battle in the Pacific.

That U. S. submarines led the way in "Operation Torch."

That the old "Sugar Boats" held the line in the wild Aleutians.

That two U. S. submarines collided *under* the South China Sea.

That U. S. submarines transported American troops, evacuated refugees, landed secret agents behind enemy

lines, carried supplies for the Philippines underground, reconnoitered and photographed dangerous enemy beaches, and performed scores of similar special missions.

That U. S. submarines cut the main Japanese oil line and by so doing all but stranded the Imperial Navy.

That a U. S. submarine torpedoed a Japanese omnibus.

That a U. S. submarine, while diving, was rammed by a Japanese plane.

That American submariners landed on the Japanese mainland and blew up a railroad train.

That a U. S. submarine torpedoed and sank a Japanese battleship.

That a U. S. submarine sank the biggest ship ever downed by a submarine in world history.

That the operating personnel of the U. S. Submarine Forces, composed of only 1.6% of the total personnel of the U. S. Navy, sank 54.7% of all Japanese merchantmen and 29% of the Japanese men-of-war downed by *all* agencies (air, sea, and land) in the Pacific conflict.

All these facts, and others equally interesting, are told in UNITED STATES SUBMARINE OPERATIONS IN WORLD WAR II, shortly to be published by the U. S. Naval Institute. Prepared by Theodore Roscoe for the Bureau of Naval Personnel from official records, patrol reports, and material assembled by Submarine Force historians under the supervision of Rear Admiral R. G. Voge, U. S. Navy, here for the first time is told the complete, authentic story of the U. S. submarines, from the first U. S. submarine shot of the war to the last. Composed of over 800 pages of action-packed narrative and more than 200 photographs, charts, and original illustrations, this is not only one of the world's greatest adventure stories but it is also one of the most beautiful examples of fine book-making to appear in years.

It is the special request of the Navy that this history be made available at the lowest possible price to all service men, ex-service men, and all others especially interested in the Navy and its personnel. The U. S. Naval Institute therefore is offering you UNITED STATES SUBMARINE OPERATIONS IN WORLD WAR II at the special price of \$5.00 per copy, postpaid, *if you order now before publication date*. (After November 1 the price to the public will be \$10.00 per copy, postpaid). If you are a member of the Naval Institute, all you need do is mail your order in on a postcard, and you will be billed for the book after it has been shipped to you. If you are not a member, merely fill out the order blank below and mail it in with your money order or check.

You may order as many copies as you please at this special pre-publication price *if you send your order in promptly*.

SPECIAL ORDER BLANK

U. S. Naval Institute
Annapolis, Maryland

Please send me copies of UNITED STATES SUBMARINE OPERATIONS IN WORLD WAR II, for which I am inclosing herewith check (or money order) for \$.....

Name

Address

.....



Official U. S. Navy Photograph

IN MEMORY OF THE SEVENTY-NINE MINUTES

At Pearl Harbor, after the war, memorial wreaths are tossed overboard by the *Laffey's* survivors in memory of those who did not return.

SEVENTY-NINE MINUTES ON THE PICKET LINE¹

By LIEUTENANT COMMANDER FRANK A. MANSON, U. S. Navy

IN TELLING what happened on the destroyer picket line off Okinawa, April 6, April 12, or the 16th, or any other day, what happened aboard the *Abele*, *Bush*, *Bennett*, the *Newcomb*, or the *LCS 57* when all the suiciders crashed, something more than a blow-by-blow description of actual battle is needed if for no other reason than to record how a man feels who has been to Hell and back again.

Let's begin with the end, for invariably in retrospect victory in battle is thought of in terms of the price paid to win. Especially so, if the price includes a son, father, or shipmate.

It was 2:00 P.M., April 17, 1945. A topless dusty brown Army truck bounced down a red-clay Okinawa lane. In the ditches on either side of the road, tiny, wrinkled, dirty, half-clothed natives trudged along looking for food or a hole in which to crawl should shells start falling again. This particular lane's roadbed, winding around to the Sixth Marine Division Cemetery on the western side of Okinawa overlooking the transport anchorage, was well hardened and seemingly more traveled than many others. This Army truck, like the dozens of others that passed each day, was taking more of the fallen to a place of rest, carrying sufficient dead to tie up all the funeral homes in a city the size of Boston.

In the truck's front seat sat the driver, an Army corporal, and two Naval officers, a Lieutenant from the destroyer whose dead lay in the truck, and the other a Chaplain from Admiral Turner's flagship *Eldorado*.

In the rear of the truck, wrapped in dark

green, flash-proof mattress covers, lay the dead. All of them from one destroyer that had been knocked off the radar picket line by the *Kamikaze*.

"Can't figure where all these stiff's are comin' from," said the corporal, obviously trying to break the uncomfortable silence. No one had spoken since the bodies had been transferred to the truck from an LCVP at Yellow Beach.

"But ya know I've been on this island almost three weeks and ain't even seen a Nip plane. Beats me—all these stiff's comin' in from our boats at sea, and no planes. Somebody said our boats was catchin' hell out sight of land, way up north some place."

Nodding understandingly, the Chaplain continued to look at the little Okinawans, walking and crawling alongside the road. The Lieutenant made no reply. He hadn't heard the driver, hadn't seen the Okinawans—he was trying to forget. Trying to forget about the radar picket line and the destroyer Navy, the loss of thousands of shipmates and dozens of ships. Why not send the cruisers to the picket line; they could take more punishment. Why not the battleship; she could never be sunk. Or even better, why not unload the supply ships quickly and clear the area? Why pick on the destroyers? How about a dummy ship, a concrete barge? Anything for a change, anything but destroyers. He hoped the United States Navy had more

¹ From *Victory in the Pacific*, by Captain Walter Karig, U.S.N.R., Lieutenant Commander Frank A. Manson, U.S.N., and Lieutenant Commander Russell Harris, U.S.N.R., Volume Five of the *Battle Report* series, to be published in December, 1949, by Rinehart & Co., New York, N. Y. Printed in advance by special permission of the publishers.

LIEUTENANT COMMANDER MANSON graduated from Northeastern State College, Oklahoma, in 1941 and taught in high school prior to reporting to Cornell University for Naval training. He served on the staff of ComDesLant and later was Communications Officer of the *Kamikazed* destroyer *Laffey* off Okinawa. A collaborator on Volumes IV and V of the *Battle Reports* series, he is now on duty in the Office of the Chief of Naval Operations.



Official U. S. Navy Photograph

KAMIKAZE VIEW!

This is how the *Laffey* must have looked to Japanese suicide planes. There are no action photos of the *Laffey* because her cameraman and his camera were wiped out in the first attack.

destroyers than the Japanese had *Kamikazes*.

"Yes, yes, those 'boats' are having quite a struggle, Corporal."

The big Army truck slid to a stop at the Sixth Marine Division Cemetery.

"Did you ever see so many stiff?" marveled the corporal. "Just look. Don't even have time to cover 'em up."

A haggard, bone-weary officer approached and introduced himself as the cemetery Chaplain, Lieutenant Commander Paul L. Redmond.

"More Navy," he said, in statement rather than question. "At Guadal, Saipan, Peleliu, and Iwo it was mostly Marines, but here it's Marines and Navy, too."

"Driver, lay them alongside the fourth column." The Padre pointed toward four long columns of the shrouded dead. Hundreds of them. The tolling burial detail, instructed to keep 100 graves ahead, was more than that number behind.

The Sixth Marine Cemetery seemed quiet and peaceful except for an occasional sharp

crack of artillery, or the dry snap of a sniper's rifle.

The bulldozer operator, in his converted grave digger, pushed the massive steel blade slowly ahead, audibly hating his job more and more—more than if he were on the front being shot at, he declared to nobody in particular.

Suddenly, "Flash Red!" and all hands scattered for foxholes; not so much to escape Japanese planes, which probably weren't coming near them anyhow, but to dodge murderous shell fragments from the ships in the harbor.

"Flash White!" The shooting ended almost as abruptly as it had begun, and hardly before the truck driver had found a pit to ditch himself.

"Why didn't you jump in one of the graves with me?" asked Redmond upon the driver's return from his foxhole. "You know, you could have been hit before you reached that ditch."

"Grave? Ugh, I'd rather be killed than use one of them graves," returned the driver,

shuddering.

It was time to bury the dead. When empty saki bottles, containing each man's identification, had been tucked inside his battle dress, the shrouded bodies were gently placed side by side in soldierly pattern.

It was late afternoon and the sea breeze had quickened, making audible only scattered phrases of the Chaplain's message to grieved comrades standing uncovered nearby. "God is our refuge and strength . . . though the earth be removed and though the mountains be carried into the midst of the sea . . . earth to earth, ashes to ashes, dust to dust."

Then sunset, and a few evening stars brightened the night which could not conceal the freshly covered graves and the unburied. This April 17, 1945, was just another day at the Sixth Marine Division Cemetery.

Now that we know the end, here's the complete story.

It begins on Roger Peter One—*Cassin Young* had relieved the damaged *Bennett*. Then *Cassin Young* had been hit. *Laffey* had been ordered, when ready, to proceed to Roger Peter One for duty.

The 2,200-ton destroyer had been bombarding Japanese positions south of Naha on April 12 when she received her new orders. Hastily her guns were trained in, and she headed for the command ship *Biscayne* to get final instructions and, incidentally, to find there some stateside mail.

Special crews came aboard, mainly radio and radar technicians to test, check and double check the destroyer's equipment. It suggested a boxer's examination before entering a title bout. The only thing they didn't take was the crew's blood pressure, and it's just as well they didn't!

After getting an up-check, *Laffey* was ordered to Kerama Retto for topping off and told to pick up a special fighter director team from one of the damaged ships. Fighter director teams called "Fido's" were composed of two officers specially trained to work with *Delegate*, code name for the central fighter director. No one really wanted to see Kerama Retto. Going there before going to the picket line was like visiting a casket company before going to the gallows.

Laffey's trip to Kerama Retto was quiet. With no enemy planes around, the crew wrote letters home, hoping they would be mailed before departing for the picket line. There wasn't much time to write and there wasn't much to write about. Most of the letters ended similarly, "but if anything should happen, remember. . . ."

Now *Laffey* was standing into Kerama Retto—for the first time since April 6. Top-side watch standers gaped in loose-jawed amazement. What a sight! What an awful sight! Grotesque patterns of superstructures etched against the blue sky; mattresses and loaves of bread floating in the oil slicks oozing from torn hulls. All over the harbor colors were at half-mast, as damaged ships buried dead.

Despite the clammy hand of death, whose fingers touched most every ship, Kerama Retto was as busy as Shanghai's waterfront. Small boats darted from one wreck to another, passing out information and initiating repairs. Patients, mostly burned ones, were being transferred to hospital ships.

Laffey's sober-faced crew just looked, sadly shaking their heads.

There was *Lindsey*, a destroyer minelayer, with her bow blown back across her bridge, the muzzle of one five-inch gun resting against the windshield of the pilot house. Wardroom linens hung in tatters from the rigging, and some chief petty officer's uniform draped the after stack.

There was *Jeffers* in one berth, her decks all twisted and burned; there was *Zellars* in another. Her surviving officers were standing at quarters as *Laffey* slid by. On her fantail a burial crew prepared yesterday's shipmates for the trip to the cemetery. Only a few days before, *Zellars*, gleaming in new warpaint, fresh out of the building yards, had passed mail to *Laffey*. Now she had a hole the size of a garage where her wardroom used to be.

"That's my battle station," spoke up *Laffey's* surgeon. "That's the first wardroom that has been missing."

There was *Sterrett*, with her starboard side caved in and her fuel tanks ruptured. *Gregory*, with her starboard side amidships burned out; *Stanly*, with her bow knocked out of alignment from a Baka bomb near-

miss; *Riddle*, *Whitehurst*, *Rall*, all with gaps in their top-hamper. There were *Gladiator*, *Manlove*, *Hudson*, *Porterfield* and *W. C. Wann*, each torn open by glancing blows from suicide planes. *Tennessee*, with her signal bridge burned out. *Idaho*, with only a few ruptured blisters, looked like a man suffering from a hangnail in a hospital full of victims of a train-wreck.

LCS 57, looking like a colander after taking three suiciders aboard, had returned to *Kerama Retto*, however, under her own power. *LSM 189*, who had been with *Abele*, hit by bomb and suicide plane. *LCS 88* and *Lang* bombed. *LST's 599, 724, and 884* damaged by suicide crashes; *557* hit by Japanese mortar shells.

Not all the casualties were from enemy action. There was *YMS 96* in a near-sinking condition from a night collision with the destroyer *Hambleton*. There were attack transport *Lauderdale*, the destroyer *Bennion*, the battleship *New Mexico*, and *LSM 279*, all damaged in the April 12 melee by gunfire of sister ships.

Laffey pulled up alongside the wounded *Cassin Young* to pick up her Fido team, and to get some first hand information about the picket line.

Her skipper told us: "Duck as fast as you can, make as much speed as you can, and shoot as fast as you can.

"You won't have time to speak your orders to the helmsman," he added. "For hard port rudder, wave your left thumb to the left; for hard starboard rudder, wave your right thumb to the right. For rudder amidships, point straight ahead. You won't have time for anything else."

Meanwhile the Fido team had boarded *Laffey*, and *Cassin Young's* crew had told about their battle—how they, with the help of the destroyer *Purdy*, had stood off 30 Japanese planes for 90 minutes, their guns shooting down 15 and the combat air patrol getting 13. Just one *Kamikaze* got through to each ship, but that was enough.

"You guys have a fighting chance," said one, "but they'll keep on coming 'til they get you."

"Yeah, they'll keep coming down until they nail you," spoke up another, "but you'll get a lot of them, too."

With that inspirational advice *Laffey* stood out of *Kerama Retto*, for her bloody vigil on *Roger Peter One*.

Enroute to station the captain told his men of the certainty of battle, of the necessity for wearing flash-proof clothing and life preservers, and of the importance of damage control during action. He concluded by expressing confidence in his crew. His confidence in his crew was exceeded only by their confidence in him. Although sickened by worry and weakened by loss of sleep, they felt that if anybody could bring *Laffey* through such an ordeal, their skipper could.

Dawn came up the morning of April 16, on *Roger Peter One*, as clear as a bell. Balmly spring breezes blew down from the Empire, and it seemed a perfect setting for anything but death. To the east a few miles a group of volcanic-formed islands broke the emptiness of the slightly rippling sea. Occasionally a sea turtle surfaced, his head to the morning sun. Now and then a shark's fin cut the surface, and flying fish raced the gentle swells.

It all looked peaceful, except for a few grim reminders: bloated bodies of suicide pilots floated by, along with bits of their planes, drifting like leaves with the tide—constant reminders, if such were needed, of the deadly seriousness of Japanese purpose.

It seemed that *Laffey* had been at general quarters for days, waiting, waiting. Time had become so jumbled that hardly anyone knew the date; sometimes it seemed that time never changed; it was the third day on *Roger Peter One*, as this picket station was designated. Some felt that each tick of the chronometer, each turn of the screw, each sweep of the radar, was eating into the precious time left to live. All doors and hatches were dogged or battened down, the blower system was off; it seemed if the entire ship was just holding her breath. Occasionally there were jumbled snatches of conversation, and one wondered what anybody could find to talk about. The pungent odor of cigarettes drifted in the closed passageways.

Then the word flashed to the phone talkers, "Alert the watch." Radar had just picked up a cloud of planes. The entire scope was covered with bogies, too many to count. It looked as if at least 50 were heading for



Official U. S. Navy Photograph

PORT OF MANGLED SHIPS

Kerama Retto, with the damaged minesweeper *Lindsey* to the left—
or what remained of her after *Kamikaze* hits.

Roger Peter One.

Cigarettes were instantly extinguished, and action seized the men at battle stations. Men in experience, but boys in years. A heavy steel door clanged shut and the voice of the skipper and the gunnery officer could be heard by those who were standing near the battle circuits:

"To Chief Engineer, forward engine room. Give us all you've got."

A Lieutenant instructed his gun crews. Everybody else waited, trying to think of something, and yet unable to tear either minds or imagination from the moment.

Then came the whir of electric motors as the gun directors came on and miraculously began to figure out the range, the problem of lead, taking every possible variant, including the roll and pitch of the ship, into consideration. The guns ground away, swinging in train and moving in elevation to meet the director's demands. You could hear the conveyor bringing up automatically-fused shells with a rhythmic clank, and the swish of the

sea as it seemed to open up to the *Laffey's* digging, churning propellers.

"Range, 10 miles," informed the Captain's talker.

"For goshsake, what in hell are dey waitin' for?" yelled an anxious gunner, anxiety trembling his hoarse voice.

"Range, 9 miles."

The silence seemed unbearable. Why didn't they come in? They should have, five minutes ago. Was something wrong? Weren't they coming after the *Laffey*? Then the gun boss passed the word:

"Stand by for main battery."

A droning sound—louder, much louder than the hum of wind through the signal hal-yards. Binoculars now revealed gnat-like specks in the sky. That was the enemy, that was death, circling, tantalizing, far out of range.

Two planes slanted downward. The *Laffey's* combat air patrol darted in to intercept. Away darted the enemy, our planes in pursuit, over the horizon. It had been a faint,

a lure to the destroyer's CAP, and they had taken it.

Two shorts and a long on the warning buzzers; bodies stiffened as *Laffey's* five-inch guns began to pound and blast irregularly—the first raid had started in! Four Vals dived together, then split, two aiming for the bow and two swinging around to come in from the stern. One went down. Another. The sky was pocked with five-inch bursts. The third enemy cartwheeled flaming into the sea. On the ship, men's throats were dry. Their palms wet. Now the steady *pom-pom-pom* of the 40's took up the heavy refrain of the 5's, as the fourth plane continued to bore in. The chatter of the 20's meant it was close, very close, ready to crash. Up, up, up to crescendo went the noise of the guns, twisting the nerves of all men with it. Ship and men were welded into one. Down went the fourth plane. Men relaxed like wax figures melting in the sun.

Spirit was growing; the steel was tempered. Let them come if they dared!

No time for relaxation! Two more planes came in from either bow to attempt what their comrades had failed. Two more Japanese knocking at the gate of the Buddhist heaven.

And then, suddenly, unbelievable, the plane that couldn't be—wouldn't be—stopped! The shock, the flash of flame, the split second of awful silence, suddenly torn by the cries of injured men and the impassive voice of a bos'n on the bull horn, "Fire, after deck house." The realization that it had actually happened. The pain of realization that *Laffey*, with all her power and security, like all other ships, was vulnerable to death and destruction.

The *Kamikaze* had broken itself against the after 5-inch gun mount, flooding the deck with flaming gasoline. The ship was ordered slowed, while she shook her head and regained her poise.

With smoke billowing from the gasoline flames *Laffey* became a much better target. Knowing that she was crippled aft, the next two suiciders struck almost simultaneously, the first shattering his plane against the same after five-inch mount and the other dropping a bomb on the fantail, sending shrapnel through the hull's bottom. Another bomb on the port quarter exploded the 20

mm. magazine, jamming the rudder. Now *Laffey* circled madly like a wounded fish, black smoke coiling above her like trailing viscera.

Repair parties were fighting fires below decks while gunners who still had guns fought the attackers from above. One gun captain, wounded early at his battle station, went to the wardroom for treatment. Finding others waiting who, he felt, were more seriously injured, he went back to his battle station where he was wounded a second time. His hair and clothes on fire, his burned body punctured by shrapnel, he was assisted to the forward battle dressing station. The next bomb, a direct hit on the wardroom, killed him.

Throughout the action the crew worked where most needed. When the radars were knocked off, radar men administered blood plasma after two minutes instruction from the ship's doctor, who had been wounded but still carried on. The paymaster threw hot ammunition over the side after his 40 mm. gun mounts had been destroyed. Another officer led a group of men into the smoke-filled, flooding after-steering compartment below the main deck in an unsuccessful attempt to free the jammed rudder. Another bomb penetrated, a dud, and was rolled overboard.

The drone of enemy planes became heavier as they moved in for the kill. Audible above everything but the explosions was the assistant gunnery officer's stream of orders to the gun captains over the emergency-rigged public address system atop the pilot house.

"Mount 42 take plane coming in on port bow. Mount 43 take plane coming in on starboard beam. Start shooting, 43—start shooting, 22, port 20's, the plane is close. Take plane port bow."

Although it had never been done in practice or combat, he took over the five-inch mounts after communications were knocked out and continued:

"Mount 3, take plane diving on fantail. Mount 3, Mount 3, dammit, Mount 3, open fire!" From his position and his primary concentration on enemy planes he didn't know that Mount 3 had taken the brunt of two planes and that most of her crew were splattered all over the fantail.

In quick succession two more planes dived into the already burning after deckhouse, snuffing out the lives of those working below in the repair parties. Now the drone of airplanes suddenly became louder. The *Laffey's* living did not even look up, until one wounded man croaked "Corsairs! They're ours!"

Marines to the rescue. Just like Hollywood!

Laffey's gunfire had diminished to the point that Corsairs followed the enemy planes right down to the ship. During one of these chases a Japanese plane knocked off one of *Laffey's* yardarms, and the Corsair directly behind knocked off one of the radars. Both planes crashed, but the Corsair pilot was later rescued. Then, another strafing Meat Ball swooped in, dropping a bomb on the port quarter. As he pulled out, he knocked off the remaining yardarm and *Laffey's* battle flag.

Grabbing a new set of colors, a signalman shinnied through the smoke to the top of the battered foremast and replaced the symbol for which he and all his buddies were fighting. The old colors were taken below. A wounded yeoman begged: "Let me hold it." He died with the scorched and riddled flag in his arms.

During some of the action the skipper had been unable to communicate with the engine room, but the engineers knew by this time

what to do. They governed their acceleration by the sound of anti-aircraft. When the 20's began firing, the throttles were wide open.

The *Laffey's* chances looked fairly slim. Fires were out of control and the ship was flooding her fantail under water. Every possible engine combination had been tried to make headway to the south, but the jammed rudder prevented it. With all this, and nearly 100 men dead or wounded, one of the officers suggested to the skipper that the ship be abandoned.

"I'll never abandon ship as long as a gun will fire," he snapped, a reply that will add to Navy traditions.

And all *Laffey's* guns hadn't quit, although those remaining had to be fired manually. Scarcely had Becton spoken when Mount 2, the one just forward of the bridge, brought down an Oscar with a direct hit on the nose about 500 yards from the ship, and Mount 1 knocked off a Val in similar fashion. Then the Corsairs took over, a round two dozen, and the battle ended 79 minutes after it had begun.

Twenty-four friendly planes now were hovering over *Laffey*. One of the toughest single destroyer-*Kamikaze* duels had ended victoriously for the destroyer. She was afloat and still capable of fighting after 79 minutes of concentrated air attack. Exactly 76 minutes longer than had been thought possible at the beginning of World War II.



NEW DEFINITION FOR "BINNACLE LIST"

Contributed by LIEUTENANT (JG) MARY R. HUNT, W(E)
U. S. Naval Reserve (Inactive)

It is generally agreed that the WAVES made quite a mark for themselves during World War II. But some of the "marks" were of the wrong kind.

At the Naval Reserve Midshipmen's School at Smith College, the class in Naval Ships and Aircrafts presented particularly difficult material to women unaccustomed to mechanical gear, and some very extraordinary examinations were submitted.

On one occasion, for example, a group of budding Ensigns was asked to define the term "binnacle list." Having forgotten the answer, one Midshipman did her best to make up a plausible definition and thereby achieved immortality overnight. "A binnacle list," she wrote, "is a list a ship gets when it grows more binnacles on one side than on the other."

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to and printed in, the PROCEEDINGS).



Official U. S. Navy Photograph

NO "CASTE" SYSTEM HERE

A good officer respects his men as much as the men respect a good officer.

MORE ABOUT THE "CASTE SYSTEM"

By EDMUND A. GIBSON

REAT satisfaction is being expressed by certain newspaper columnists over the Army's decision to incorporate a number of changes into its Court system, among them the one which makes it possible for enlisted men as officers to sit on Courts Martial. On the other hand, these gentlemen are completely put out over the fact that the Navy decided to leave its system for the handling of military justice in the *status*

columnists are not the only writing men who are impressed with the idea they are acquainted with the enlisted man's wants and needs. Divers others have put it upon themselves to remedy the "caste system" under which, they say, the rank and file in the Armed Forces have so long suffered browbeating military justice from their officers. A leading column on the front pages of the Scripps-Howard newspapers a year or so ago was full of complaints received at first hand from soldiers in the occupation forces overmaking things pretty torrid for the American Army command for quite a while. One gentleman several years back filled *Life* magazine with what *he thought* the Navy men thought was wrong with the uniform.

Scripps-Howard writer produced very imposing figures showing that the percentage of Army enlisted men in the ranks covered who had complaints to air was very large, compared to those who had nothing to groan about. The party advocating Navy uniform change also deduced, from personal interviews with members of the Armed Guard crew of the merchant ship on which he served, that a large proportion of Navy enlisted men were positive squawks on this subject which they were to ventilate aloud, while but a small number had no complaints to make.

...; I have never been anything else but

an enlisted man, myself, and I hesitate to express views contrary to those entertained by people who may, for all I know, be experts on what they are talking about. But having handled men in large deck divisions aboard ship for a number of years, and having spent most of my life in the company of men before the mast, I take the liberty of advancing it as my opinion that the percentages and proportions worked out by the gentlemen mentioned above are somewhat inaccurate.

I am ready personally, at any time, to go on board any vessel in the United States Navy, call a muster on those who have something they want to growl about, and get a turn-out of exactly 100 per cent. I am insufficiently acquainted with Army matters to know whether I should get similar results in that branch, but I consider it extremely likely. I am astonished only by the fact that the Scripps-Howard columnist *did* apparently find a certain number of enlisted Army men who had no fault to find with *anything*. I think it might be a good idea to order a medical examination on these few. There must be something the matter with them.

Enlisted men have always growled incessantly about everything it is possible to growl about, and they will continue to do so as long as there is a uniform and a man left to wear it. Experienced officers discount this as so much "steam," and are wise enough to leave their men alone as much as possible.

WITH MORE than ten years of service on deck in both the Merchant Marine and the Navy, Mr. Gibson is well fitted by first hand experience to discuss the subject he has chosen. He has published numerous articles on the enlisted man in the Navy, and is author or co-author of various sections of training courses for both officers and enlisted men. Now on inactive duty, he is connected with Navy Training Publications Center, Naval Gun Factory, Washington, D. C.

so that they may conveniently let it off. A full 99 per cent of the grousing they do is merely for the pleasure of hearing themselves talk.

An enlisted man in the Regular service will make the assertion many times during his naval career, to anyone kind enough to listen, that it is a great Navy for the officers and a lousy one for the men. Actually, however, his notions of the kind of a life led by an officer are of a very vague and indefinite description. People on the outside suffer continuously from the notion that officers spend all their time getting into enlisted men's hair and coming it over them in lordly fashion. Regular service men know that, as a matter of fact, they practically never come into personal contact with an officer. From the very nature of the Service it works out that the only people who are really in a position to give enlisted men a rough time are *other enlisted men*—Boatswain's Mates, Masters-at-Arms, etc.

The romantic notion persists, among people like the aforesaid columnists who desire to reform the Court Martial procedure, that a jury of the accused's peers—i.e., other enlisted men—would be more likely to pass impartial justice on an enlisted man than do boards composed exclusively of officers. They have a picture in their minds' eyes of the great body of enlisted men standing loyally shoulder to shoulder in defense of each other against their officer oppressors. Nothing could be further from the truth.

Take myself, for instance. I have the honor to hold the rating of Boatswain's Mate, First Class. While we are no longer officially the wielders of the "cat," it is a fact that as a general rule a Boatswain's Mate's best friend is his mother—no other! Getting square with some Boatswain's Mate has been the life-long dream of many a Navy man. It's not that we're bad fellows inherently, although occasionally a small mind does run askew when vested with a rather large authority. It's merely that the very nature of the job makes it difficult for a Boatswain's Mate to be a kindly soul.

Now, to an officer sitting on a Court Martial all enlisted men are alike. Unless some personal element enters into the situation, which it practically never does, there is no

conceivable reason for an officer to be anything else but impartially disposed toward the defendant. If I were to go before a Court Martial of officers right now—which Heaven forbid!—I should doubtless have a few things to worry about, but none of them would be fear of any prejudice on the part of members of the Court.

Assume, on the other hand, that I appear before a Court of Yeomen, Hospitalmen, Storekeepers, Radiomen, or others frequently possessed of the idea that a Boatswain's Mate thinks he is better than anybody in the Universe. On two separate occasions I have been unexpectedly knocked clean out from under my little white hat by gentlemen to whom I had never been introduced, and whose countenances were completely unfamiliar to me. I am convinced that I was not personally objectionable to either of these parties, but that the sight of the fouled anchors on my sleeve awoke unpleasant memories which caused my attackers to run amok. Place either of these gentlemen on my Court Martial, and my chances of an opportunity for examining the interior of Mare Island, Portsmouth, or some other Navy brig at close range and at long leisure will be excellent indeed.

Basically there is no difference in mental caliber between officers and enlisted men. I am willing to state positively that the native intelligence of the rank and file is equal in every respect to that of the commissioned ranks. But I don't think anyone can deny that the average officer is on the whole a *far better educated* person than the average enlisted man. He is certain to be better equipped for drawing a proper logical conclusion from a given set of facts. His fund of general information is bound to be much greater, making it easier for him to ferret out the truth on direct or cross examination. He is certain to be much better able to assimilate and understand the intricate rules of courtroom procedure.

I have been shipmates with a great many first-rate man-o'-war's men, and friends with a good many more. I have also devoted more than a year of my variegated career to the study of Law. Looking back over the roster of my enlisted shipmates and friends, there are perhaps two to whom I would

to explain the tortuous windings of the Parsay Rule with any hope of success. I think of none who might be able to reach the point where a Justifiable Cause transforms itself into a Rebuttable Assumption. I should hesitate before trying out for any one of them the eccentric pursued by the Burden of Proof, for I never quite got the hang of it myself. I noted the fact that many officers sitting on Courts Martial are themselves somewhat like the above, nevertheless the fact is that only an academically trained man will ever be able to grasp them at all. I am convinced that a Court Martial composed of enlisted men, as enlisted men now would be reduced to the necessity of learning most of the rules for procedure on their side, with a consequent lessening of the defendant's chances for a fair trial. They may point out the fact that civilian judges sitting in judgment on civilian defendants are subject to the same deficiency of knowledge. There is the difference here, however, that a civilian jury is carefully selected in the law by a judge supposedly on the same, who also controls the court-proceedings in a manner which, at least in theory, guarantees the defendant all the rights to which he is entitled. On the other hand, any member of a Court Martial is the presiding member under the new caste system, and a buck sergeant, who may have matriculated at the sixth grade, now finds himself struggling with the intricacies which have puzzled trained lawyers for centuries.

It is now possible for enlisted men to sit on Courts Martial, it is reasonable to assume that they may also be appointed as counsel for the defense. Now, an officer acting as defense counsel generally takes time to work up a good case. He has the right to do so, and if he gains an acquittal through some clever maneuver, he gets a great deal of pleasure out of bragging in the wardroom about his astuteness. All this is put out decidedly to the advantage of the defendant. I am persuaded that enlisted men would neither be capable of nor interested in the painstaking work necessary for the preparation of a good defense, nor are they usually possessed of the leisure time

necessary for such matters.

I cannot see, therefore, how the inclusion of enlisted men on Courts Martial can result in anything other than damage to the chances of a fair trial for enlisted defendants. Apparently, however, the question of a fair trial is not so much concerned in the matter as is the fact that the exclusive right of officers to the management of Court Martial proceedings is held to be another evidence of the existence of a "caste system."

It is a rather extraordinary thing that the Services wobble along for some twenty years or so with all the iniquities of a "caste system" flourishing without protest, until a war comes along and blows the lid off the thing. Apparently the sufferers under the system are content to remain silent until some newspaper columnist appears to act as a voice for their resentment.

This may be so—but I doubt it. It is my honest opinion that men in the Regular Services, professional soldiers and sailors, do not ordinarily complain about the "caste system" for the simple reason that they are *not aware of the fact that there is one*. Speaking for Navy men, I am certain that they are entirely without any feeling of inferiority, social or otherwise, to their officers. If superiority or inferiority of any kind enters into their contemplation at all, it is in the shape of a conviction, doubtless a wrong one, that every Service man, as a professional warrior, is above the narrow interests which obsess the average civilian.

It seems to be impossible for people from the outside to grasp the psychology of a man in the Regular Service. A person who may be "Somebody" in civilian life comes into the Service in wartime in an enlisted capacity. Immediately the fact that he has to salute an officer seems to cause him hot resentment, which is not cooled off to any extent by the fact that the officer has to return the salute. His own inferiority is pressed down upon him by the fact that he has to salute first. Worse still, he has to say "Sir" to an officer, and in this case the officer does not say "Sir" to him. Such things as "Off Limits to Enlisted Men," "Officers' Country," etc., are as gall and wormwood to his soul. He spends all his time peering into the wardroom to see

whether the chow is better there, or gathering information on stations and reservations where the officers wallow in unlimited quantities of expensive Scotch, while the enlisted men fret their lives away on beer. His feelings about Social Inequality are continuously on the surface.

Now, I am not here to deny that the goats are pretty well separated from the sheep in the Service. I won't even argue about whether it *could* be any other way or not; maybe it could, although I believe that a different system flopped in Russia upon trial. And in the very nature of things it is inevitable that the goats do get considerably the better of the deal. But what I do maintain is this: the above are things about which a Regular enlisted man does not give one good solitary hoot.

An enlisted Navy man will growl about everything under the sun if anybody will listen to him, but he is really seriously interested in just four things: (1) enough pay, (2) enough liberty, (3) enough chow, and (4) not too much work. He salutes an officer automatically, just as he should his rifle, without thinking anything about it at all. He calls him "Sir" as a title, just as he would "Lieutenant" or "Captain." Social stuff, if thought about at all, is a big joke to him, and if you tried to tell him he was inferior to his officers he wouldn't know what you were talking about. Secretly, he generally considers himself just a little more knowing than they are, but in any event, he doesn't like to have officers around, doesn't want to fool around the Officers' Country, couldn't be dragged into an Officers' Club, and definitely doesn't give a damn whether they would let him in there or not. In the normal course of his existence, that is an issue which will never arise, and it never does arise except when a number of socially conscious civilians come into the Service during a war.

Incidentally, it has always struck me as peculiar that these latter always seem to find the alleged discrimination in the Service such a new thing. I worked in an office ashore at one stage of my career (which has been a somewhat checkered one, as mentioned before), and I had a good opportunity to observe the principles of democratic

equality which were in force there.

The President of this outfit was these males you see now and then. Nature originally intended to wear a turban. Nevertheless, when he entered the room where a group of us stood waiting, the reason we didn't salaam was because there wasn't room for all of us to do so at once. The best we could do was to face him. The East, as represented by this monumtous insignificance, and hold our breaths in respectful rapture like the Faithful at the call of the Muezzin to prayer. Seems sickening, doesn't it? But it's easy to stand when you recollect the fact that the turban were scarce, and most of us depended on our very existence on the whims of a dreary little Jack-in-office. He could often do—bring the world of some of our retainers of thirty or forty years' service to a crashing end with a mere word.

Now, I have never seen any "battered up" by enlisted men to the extent that this fellow was by his quaking employees. As a Master-at-Arms I have seen a long, desponding line of offenders awaiting judgment at Mast, each one wracking his brain in the attempt to think up some new bit of yarn which would put the best light on his particular peccadillo. Even here I have never seen the fulsome kowtowing, groveling, and downright grovelling I have seen ashore.

However, most of that is neither here nor there. But it does seem to me that people who talk about the "caste system" are unable to conceive of any order of things which does not involve social subordination of one group by another. You cannot convince them that, despite all this, most enlisted men consider themselves a good deal superior in many ways to their officers, and certainly have no feeling whatever of inferiority to them. They cannot believe that tactically all Regular officers look with respect upon the row of hash marks on the arm of an old weathered Chief. They transplant civilian standards into a system where respect each other as *men*, where distinctions of rank are preserved as a matter of practical necessity, accepted by everyone as just and nothing more.

Many a person of the type refer

sioned during the War, decided to democratic notions into effect by ally with his men. He nearly always red to his surprise a fact which has ell-known to Regular officers from memorial; namely, that enlisted men ively dislike and distrust a back- g officer. I well remember an officer l to encounter in places on the Beach we had previously considered our e resented his presence there, for we men are exclusive, too, in our way. all me 'Nick' ashore, boys," was this watch-word, and I can't describe atemptuous manner in which the "Call me 'Nick' " used to be bandied he ranks.

all the above in mind, therefore, I the proposition that perhaps news-columnists, magazine writers, and beyond the pale are not the best persons in the world when it comes wing what an enlisted man thinks, feels, or what are the best means ing him happy.

the proposed uniform change, for e. It was experimented with, for opinion—or what passes for such—tly badgers the Naval command into ed action. As the loud wails and arose from the Fleet, and particu- om a miserable Experimental Squad sure Island, San Francisco, who were to wear the suggested get-up to the animent of hoots and jeers from ipmates, one feature after the other andoned. Even the insignificant hich survived are still the subject as of protest. Yet the gentleman who he original article in *Life* was certain e present "monkey suit" was anath- all bluejackets. He described the at, cherished by Navy men, and the nd of a topper which has ever suc- in conforming itself to the eccentric tions of this writer's skull, as "the rd in 'Heh-heh,' " I remember.

the fact is, this person never was and will be a Navy man. The "monkey

suit" and the white hat were objectionable to *him*; and being satisfied with his own discernment, he concluded that they must be the same to everyone else. The other gentlemen calculate along the same lines. It irks *them* to render deference to superior rank, therefore it must irk everyone. They don't understand and can never understand the psychology of men in the Regular Service.

Who does? Well, you must have served with men before the mast to really know them; in other words, you must have been one of them. Failing this, it is reasonable to assume that those who know the enlisted man next best are officers who have had long experience in handling him. It is positively essential to the officer that he keep his men's morale at as high a level as possible. He may not care a damn about them personally, but with his superior's eye upon him, he must get the most he can out of them. And, contrary to the general belief, enlisted men are not entirely without weapons of protest, for they can always collectively fail to "put out." Any officer who has had his Division, or even his command, lie down on the job can tell you what a sad state of affairs this is, and how impossible of correction it is by mere rigid imposition of punishment.

The Naval Command devotes a great deal of time and effort to a study of the best means for enhancing morale without the sacrifice of the discipline more necessary aboard ship than anywhere else in the world. They may not do it because they want to. Perhaps it's because they *have* to. For the enlisted man it works out the same, either way.

Newspaper writers and columnists have their place in the civilian scheme, in the discussion of matters they may be reasonably expected to know something about. When one of them has served out a cruise or two in the ranks, he may then be presumed to be an authority on the enlisted man. Until then, it should be proper to suppose that the Navy knows its people best.





Official U. S. Navy Photograph

THE SAFETY OF THE COUNTRY MAY LIE IN THEIR HANDS
Would additional inducements and rewards insure greater efficiency?

NAVAL EFFICIENCY

By LIEUTENANT (JG) ROBERT J. MASSEY, U. S. Navy

CAN WE, the officers of the Navy, increase the military effectiveness of the Navy without increasing the cost to people? Or, is the Navy as efficient as we make it? What does the term efficiency mean to you? To some people the word may have a vague meaning, but when an engineer uses the term in his profession, it has one definite meaning. Let us adopt for our own the engineer's definition for the efficiency of a machine: "The efficiency of a machine is the ratio of the work a machine does to the energy supplied to it." In rating naval efficiency, we cannot, of course, come out with a neat percentage answer as we might if we were calculating the efficiency of a machine, but the definition will be helpful in that it focuses our attention on the important elements of all efficiency—results achieved and efforts expended.

For a machine, if we translate the engineer's definition into naval terms, is obeying the whole naval establishment. But what kind of "work" does the naval machine do here, for the peacetime Navy, we run into difficulties, because the Navy doesn't do any of its main work, wartime combat. The Navy usually works at its fighting job only in time when its work is to fight. In peacetime its function, apart from exploration, is the art of diplomacy, showing the flag, etc., to be ready to fight and ready to win—so that no potential enemy will run the risk of having the machine work on him. We must, therefore, define the primary work of the naval machine in peacetime as the ration and the maintenance of the Navy to fight, which we will, for convenience, call the generation of military poten-

that is the energy supplied to the Navy which it is to accomplish its work of

—
opinions or assertions in this article are the ones of the writer, and are not to be construed as representing the views of the Navy Department or the naval service at large.

being ready to fight? We might say the energy is the annual naval appropriation, a matter of some six billion dollars. That explanation does not help much, as a dollar is nothing, a rather meaningless abstraction; it has no reality of its own; its reality is all in the goods and services it commands. The real energy supplied the naval machine is not dollars, but goods and services.

At the present time the total of all the goods and services produced in this country in one year have a value of about 240 billion dollars. Thus our naval appropriation of six billion dollars is $2\frac{1}{2}$ per cent of all the country's goods and services, or of the national energy as I prefer to call it. The real energy supplied to the naval machine to accomplish its work of being ready to fight is $2\frac{1}{2}$ per cent of the total efforts of all the people. Thus the efficiency of the Navy can be defined as the ratio of the military potential generated to the national energy supplied to it.

How efficient should the Navy be? That question probably sounds facetious, but it isn't. Ask it another way. How well should you do your job or run your command? Ask that question of naval people from the highest admiral to the seaman recruit and you would probably get a variety of answers. There is only one *right* answer: The Navy should be as efficient as it is possible to make it with the means available. If you agree with that principle, can you fail to agree with its logical corollary that any honorable policy which will increase efficiency should

WINNING HIS wings in early 1944, Lieutenant Massey served through 1944 and part of 1945 as a member of Patrol Bombing Squadron 117 in the Pacific. Transferring from the Naval Reserve into the Regular Navy he served for two and a half years as a member of Fighting Squadron 2 Baker on the U.S.S. *Midway*. At present he is attending the University of California at Los Angeles under the Navy's Five Semester Program.

be adopted? If we have it in our power to increase the fighting power of the Navy without increasing the cost (an increase in efficiency), it is our duty to do it.

Sometimes we have a tendency to assume that we are doing our job "well enough." How often have you heard, "The war is over, this is the peacetime Navy"? We may think that what we are doing is of little consequence, therefore does not require our best efforts. We do these things without realizing their implications.

Such reasoning gives rise to an unhealthy condition for the Navy as a whole. Technically, it is an unstable situation. I call it second guessing. Congress balances the needs for defense against the ability of the economy to pay, and arrives at a naval budget which it believes is the best compromise. If we work less efficiently than we can, we are second guessing the Congress and the people. We are in effect saying that the Congress has overestimated the military needs of the nation; therefore, we cut our efforts so that the total military potential generated is less than that which Congress estimated and more in line with our own estimate. The Congress then will either devote more of the national energy to defense to bring the potential up to *its* estimate (in which case the second guesser will cut his efforts more); or, as is more likely, it will observe that we are not making the best use of the means provided and cut them so as to eliminate the waste, with the result that both the waste and the military potential are reduced proportionately. In one case the country will be devoting too much of its energy to defense; in the other, it will be getting less military potential than its security demands. It is our duty to do all we can with the means provided.

In a military organization it is easy to get an illusion of efficiency. The reason why we think we are efficient when we are not is that the peacetime product of the military machine is so intangible and hard to visualize. I believe that the mistaken idea of efficiency arises when we lose sight of the ultimate purpose of the Navy as a whole, and begin to think of our own activities—which should be only means to the end—as ends in themselves. Of course, the whole naval machine

cannot be more efficient than its parts, but the parts can efficiently do things which do not contribute fully to ultimate naval efficiency. One could have a very efficient radio in a midget auto racer, but it would not contribute to the efficiency of the car. There can only be high naval efficiency when each part of the Navy contributes all of its energies to the development of military power which can be brought to bear against some physical objective vital to a potential enemy.

How easy it would be to see our efficiency if we were engaged in some other work! If we were doctors, we could count the people we had helped. If we were police, we might count the arrests we had made. If we were running a factory, we could see solid achievement coming off the end of the assembly line. But what are the results of our efforts? Our product cannot be packaged, weighed, and sold by the unit. We are engaged in producing a potential, the ability to do something. Whether we are actually producing the potential or not can only be told for sure when the time comes to deliver. The ability to fight can really be measured only by a fight.

The problem of recognizing when we are producing the maximum military potential sounds difficult, and it is. The path of history is littered with the remains of nations that thought they had the power but did not. The problem is difficult, but not impossible. We know with a fair degree of accuracy the point where, in case we are called on to deliver, our potential military power must be converted into actual military power. It is somewhere near the muzzles of some guns, or the mouths of some torpedo tubes. When a dive bomber pilot is diving on a target, trying to get his plane lined up so that his bomb may hit, that point of transition from potential to actual is close at hand. In peacetime, we cannot go beyond the potential stage; we can only surmise what the actuality is like; but if we make sure that as much of our national energy as possible gets up to the muzzle of the gun, to the mouth of the torpedo tube, and to the diving bomber, and that the man aiming the gun, conning the submarine, and flying the bomber is as well trained in his job as we can possibly train him, then we can feel fairly certain that the actuality

would not be a disappointment. We can't know for sure in peace just how efficient we are in war, but we can make an intelligent estimate.

To help estimate efficiency, let us go back to engineering, where it is relatively easy, and consider the reduction gears in a ship. Each reduction gear has a coefficient of efficiency, which is less than 1 of course. The turbine puts out a certain amount of power, but it is not in an immediately usable form since the turbine shaft is turning at too high a speed, so we use reduction gears. The first reduction gear reduces the speed of rotation, it delivers less of the original power, but in a more nearly usable form. There is less actual power since the gear has taken its toll in friction loss. After the power goes through enough reduction gears, what is left is delivered to the shaft in a usable form. What would be the effect on the overall efficiency of the unit—turbine, gears, and all—if we would reduce the efficiency of the last reduction gear from say 98 per cent to 49 per cent?

I have brought up the reduction gears because they are something which every trained naval officer is familiar with and because they act very much like fire hoses; I want to use fire hoses to make a point. Each section of fire hose also has its coefficient of efficiency. Water comes out of a hydrant with a certain head of pressure. In this case, the water can't do its job because the fire is some distance from the hydrant. The water has lots of pressure, energy, but it just doesn't do any good where it is. We add a section of hose. That hose takes some pressure from the stream of water, but gets it nearer the fire. When sufficient sections of hose are added, each taking its toll of the pressure, the water reaches the fire as a much feebler stream than it was when it began; it has not much pressure, just all that is left.

Imagine this fire hose as the Navy. The hydrant is the farms and factories of the country. The Navy takes the raw energy from the farms and factories and converts it into a usable form. Of course each stage of transition from raw energy to usable military power takes energy from the stream, just as sections of fire hose or reduction gears do. Our hose, the Navy, stretches all the way

from the farms and factories of this country to the scene of the fire which, let us say, is in the Mediterranean. Whether this stream of water puts out any fires or not depends to a large extent on the skill of the man who is aiming the nozzle. In our Navy, that man is the one who aims the gun, conns the submarine, or flies the bomber. There is not much of the national energy left when it gets to him, but what, if anything, will become of it is entirely in his hands.

At the present time the Navy's battle line is its carriers, just as battleships made up the battle line after the First World War. As long as this condition prevails, a large part of the national energy devoted to the development of military potential through the naval machine must pass through the carriers, through the air groups, and lastly through the hands of the pilots before it can be converted into actual military power; that is, before it can affect an enemy. The pilot's efficiency is a factor by which the efficiency of all of the Navy behind him must be multiplied, just as the efficiency of the last reduction gear is a factor by which the efficiency of the whole unit must be multiplied. After everything else is done, it is up to the pilot with his two hands, his two eyes, his training, and his courage to convert the potential military power into actual. His is a grave responsibility. Since so few pilots are in a position to influence the over-all efficiency of the Navy to such an extent (how many combat carriers do we have in commission now?), I propose it as an axiom that those pilots should be the best that it is possible to have.

The question is how to develop the best pilots. Even though Navy pilots have always stood well in any comparison, I say they have not even begun to approach their potential proficiency. If you think our pilots are about as good as it is possible to be, I suggest that you take a look through a representative file of Aircraft Accident Reports. If you don't have access to any AAR's, then read Grandpa Pettibone in *BuAer News*. The pilot can improve, but he cannot *be* improved; he must improve himself. All that the rest of the Navy can do is give him the incentive and opportunity for improvement.

Let us consider the problem of incentive;

it is one which the philosophers are still arguing about. The question is: Why do anything? The Chaplain, who has been trained in philosophy, says we do things for hope of reward and fear of punishment. You know, the stick and the carrot—or in his case, to go to heaven and keep out of hell. Of course he is absolutely right. If you will put the stretchers on the definitions of reward and punishment, you can explain anything, even the last election. But if a man found a wallet in the street and returned it to the owner who had promised a liberal reward, he would expect something more than an inner feeling of satisfaction for having done the right thing. The greater part of human behavior can be explained on the basis of reward or punishment in the sense that the man in the street uses those words. The pilot is no exception. Perhaps there is a small number of pilots who are motivated by higher considerations, but the average pilot needs a system of rewards and punishments to develop to the limit of his capabilities.

What is the incentive for the pilot? He is a line officer, and like all line officers he hopes for the reward of selection and promotion and fears the punishment of being passed over and separated. What does the pilot have to do to gain the reward and avoid the punishment? Take a look at the promotion examination and see. His abilities as a line officer count much more than his abilities as an aviator. Which would count the most toward the promotion of the skipper of a fighter squadron, his ability to discharge efficiently his administrative duties, or his ability to lead his squadron in the air in such a way that it can develop its full military power? If it is military power we are seeking, then we should arrange our system of rewards and punishments to encourage its maximum development. We should have *professional* aviators. We should have professional aviators who are rewarded or punished according to their ability in the air where the military pay-off will occur. We must abandon the fiction that an aviator is, and must be, a line officer. Instead of trying to make him a jack of all trades, let him become a master of military aviation. Increase the pilot's efficiency and you increase the efficiency of the whole Navy. Reward him

for being a top-notch aviator, not for being a good administrator or boat officer.

We must overhaul the incentive system so as to induce the development of the best possible aviators. But what is the ideal aviator like? What are we seeking? When we know our ultimate goal, it shouldn't be hard to plot a course to reach it. We must find the qualities desired, then mould the system of rewards and punishments in such a way as to encourage the development of those qualities. In the meantime, while the perfect pilot is an unknown quality, we can improve what we have. He must do what he does better. If it is gunnery, he should improve his score; if it is bombing, he should get more hits. He should be able to fly in any kind of weather and get where he must go. Above all, he should not kill himself or wreck his plane. To improve the pilot as we now have him, we should reward ability at the fundamentals of military flying.

The problem of selecting the best aviators should be handled the same way we select a world's heavyweight boxing champion, by competition. I am proposing what a labor leader would call a vicious speed-up. Our first string pilots would have all of the job security that Joe Louis has in his position of champion of the world—and no more. As long as our pilots are the best, they would be on the first string and accorded top reward.

To facilitate the selection of the best pilots, a system similar to the Naval Academy's class standings could be used. In the arts in which proficiency can be measured, such as gunnery and bombing, each pilot would earn a fleet standing, or a position on a fleet curve. The selection board should examine a pilot for tactical proficiency in the air and in type. It would be up to the board to evaluate such unmeasurables as forehandedness, character, etc. The selection board would be able to pick with a fair degree of accuracy the best pilots, just as present selection boards try to select the best line officers to run our ships. Selection boards would probably make minor mistakes in judgment, just as sometimes a football coach may keep a player on the bench who is more capable than the one in the game, but the average of the fleet pilots would be better, just as a football team selected by compe-



International News Photograph

U. S. NAVY CARRIER PLANE OVER WAKE ISLAND

Should a fighter pilot be paid more than a naval aviator who is doing purely administrative work?

tition judged by the coach is better than one would be if it were selected on a basis of the academic standing of the players.

It can't be predicted exactly how naval aviation would be organized if it were put on a competitive basis, but here are my ideas on a possible set-up. New aviators would join the fleet as apprentices after they had completed their operational training. When their apprenticeships were over, the aviators would compete with all of the other apprentices for the available positions on the first string, the fleet regulars. After becoming a regular, competition and attrition would continue as long as a pilot continued to fly. By such a rigorous system, we would be assured the very best leadership for our aviation. The men who commanded our aerial task forces in the air would be the best that

it was possible to train and select. The eliminated pilots would comprise the fleet reserve. Of those who were eliminated along the route, some, the ones who had the inclinations and the abilities would fill all the various administrative billets which call for aviators; the rest, the ones who did not want to stay in the Navy, or who did not have administrative talents, would return to civil life and the organized reserve. Those eliminated pilots would also continue competitive flying. There would be constant attrition to eliminate the marginal pilots. When pilots were eliminated from the reserve, their first days would be over. The pilots retained would comprise the first and second lines of reserve pilots. I don't mean the United States Navy Reserve in this case, but reserve in the

that a football player on the bench is a reserve.

Selection and promotion machinery set up in the manner I have indicated would automatically solve one very difficult problem of today's aviation, that of the sub-marginal pilot. Probably all of us who fly have known pilots of whom it was said, "That guy is a menace. He is going to kill himself and his crew one of these days, just wait and see," and the prediction was fulfilled. At present a pilot must be almost hopeless before he comes before a disposition board for reclassification. It is a heart rending decision for a skipper to make, the decision whether to send a pilot up for reclassification and break his heart, or wait and see and perhaps have him kill himself and others. I know of one case which particularly illustrates this dilemma. This pilot crashed during field carrier landings in operational training. When he got out of the hospital, he was a JG—he had been a boot ensign at the time of the accident. He was sent through operational again and went to the fleet. In his squadron he had difficulties, but it was thought that he would work out with more experience. Perhaps someone's judgment was influenced in part by sympathy for the boy; everyone liked him, and he wanted to fly so much. On his first cruise he strained the wings on a couple of Corsairs by diving for the deck; the planes were strikes. (The wing roots on a Corsair sometimes give way during normal landings just from the fatigue of previous hard landings so it is difficult to say with certainty that the pilot flying the plane at the time is responsible.) One day when his squadron was landing, he came in fast, took the cut and dove for the deck, just like he always had, only this time the hook didn't engage a wire. The plane bounced, cleared the first barriers—the bow was full of parked aircraft with pilots, plane captains, gas crews and all—then the tail hook snagged the top wire of the last barrier. By the grace of God and six inches of tail hook, the only casualty was one more first line fighter. They didn't dispose of the pilot then. They might have, but his rejection for a regular commission came in and he took his discharge. By a system of competitive attrition, the sub-marginal pilot would automatically be eliminated, and with-

out the necessity of anyone arbitrarily breaking him.

The elimination of the sub-marginal pilot is in accordance with the desirable policy of developing the most military power with the means available. By eliminating the sub-marginal pilot the Navy would be spending its training dollars where it could get the most for them. (I assume that the primary function of peacetime naval operations is training.) Why should the Navy—really the people; it is their national energy we are working with—spend \$100,000 to develop a pilot to a particular degree of proficiency when it could get the same proficiency from another for \$50,000?

It is generally agreed that the next war—and the possibility that there will be a next war is the only reason why we spend this 2½ per cent of our national energy on a navy—will be a vicious, quick-opening affair, a *blitzkrieg*. There is talk of throwing atomic bombs around, of winning quickly or losing permanently. By having our very best pilots in the fleet, we are assured of being able to develop the maximum offensive power with our carrier navy in the shortest possible time.

If the war *should* drag out into a war of attrition, as the last two world wars have, then the problem of expanding the Navy air force would be greatly simplified. The air groups could be doubled by simply splitting them and filling them with the reserve. Each fleet pilot would take a reserve on his wing. Since the fleet pilots would be the best through elimination, they would all be capable of immediately stepping up to the next rung of responsibility.

One might object that by having our best pilots in the fleet, we might lose our cadre in the opening of hostilities. That is a distinct possibility. But if it is to be an atomic *blitzkrieg* we must win quickly, or lose. By keeping the best till the last we would not be assured of winning the war, only of losing the first battle.

Let us return to incentive, the reward for all this competition. All aviators draw hazardous duty pay, flight pay. This is entirely proper, since flying still involves risks and frequent casualties. However, there are many jobs in the Navy which now call for aviators (WAVES or AVS officers filled them

during the war) which involve flying only in a monetary sense. If flight pay is to compensate for hazardous duty, more yearly pay over a shorter life span, then is it right to give it to a person just because he wears a pair of wings, regardless of what his duties are?

Under the present system it would be very difficult to modify the flight pay system along more reasonable lines. If we should decide to award less flight pay for the desk jobs, or eliminate it altogether, then who is going to decide which aviators shall go to the fleet and which shall go to the bureau? If the question of who fills the desk jobs and who flies in the fleet were decided by competition, then the way would be open. By paying more flight pay to the fleet first-string pilots and less to the reserve, we would add more incentive to the competitive system. The function of the naval machine is to produce military potential or ability to fight; I am proposing that we give the greatest reward to those who produce the most of it.

Since all pilots, regular and reserve, would be on a competitive system, the flight pay would only go to those who were still contributing the money's worth of military potential. In other words, all flight pay would be for services currently rendered, not as a

sort of pension for having once been a pilot.

I have presented some criticism—constructive, I hope—of our current system and some suggestions for what I consider are improvements. Since many people in the Navy may disagree with my conclusions, it is expected that vigorous rebuttal will be made. Such rebuttals will be helpful, as they will no doubt shed more light on the subject than I have been able to bring. November 8, 1948, in a memo to the services, Secretary of Defense Forrestal said in part: "I . . . welcome the freest and most vigorous expression of opinion and statements of belief within the military establishment itself, because it is only by such healthy and objective critiques that we can avoid the danger of inertia and atrophy. . . ." If I am wrong in my argument, it can be proven by demonstrating my errors in three points: (1) the definition of naval efficiency, (2) the contention that any honorable policy which will increase efficiency should be adopted, and (3) the contention that having professional aviators, competitively selected, would increase efficiency. If those three points are conceded, it will be exceedingly difficult to deny the conclusion that we should have professional aviators, even if all other points in my argument are refuted.



"OFFICERS AND GENTLEMEN"

Contributed by LIEUTENANT FRANK C. HEROLD, *U. S. Coast Guard (Retired)*

In 1944 I was a member of a board inspecting coast guard units on the Great Lakes. We happened to be in a shipyard in Bay City, Michigan, where some DE's were being built. The unusual part of it was that they were built keel up, the hull being turned upright on a huge cradle as construction progressed.

Our duties did not include inspecting vessels under construction, but being interested we arranged for an off-the-record trip through one and selected one nearing completion.

This yard, like most war plants in those days, had its share of "women in overalls" and all in all they were doing a fine job. It so happened that one of these female mechanics hit her thumb with a hammer, or dropped an 18" stilson on her toes, or had some such equally painful accident, because just as we entered the engineroom where it had happened she was letting out a string of oaths a mile long without using the same word twice.

The yard official who was with us very tactfully and humorously admonished her of our presence with:

"Ladies! Watch your language. Gentlemen are present!"

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS.)



Official U. S. Navy Photograph

A FOOTBALL GAME AT THE NAVAL ACADEMY

Do athletes make better naval officers than non-athletes?

THE NAVAL ACADEMY ATHLETE AS A NAVAL OFFICER

By VICE ADMIRAL CARLETON H. WRIGHT, U. S. Navy, Retired

OUR ADVERTISERS make fortunes by cashing in on the knowledge that if a statement is made often enough, the reader or listener comes to accept it as fact.

Within the Navy we have heard "Athletics develop the qualities essential in a successful naval officer" so frequently reiterated that

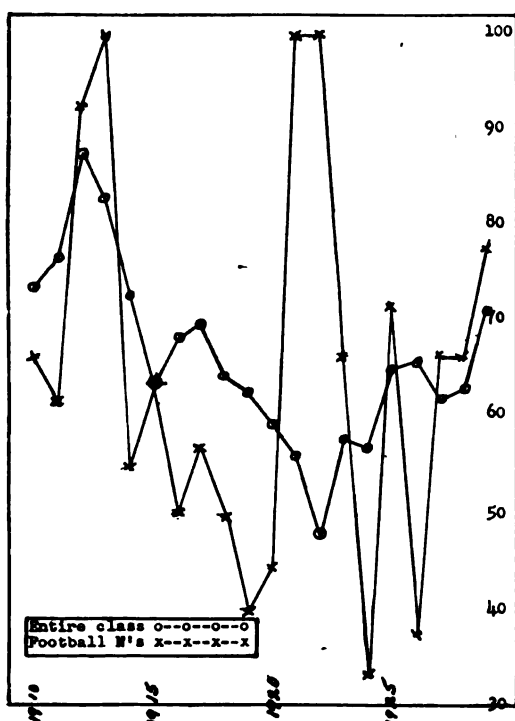


FIG. 1. Percentage of graduates reaching at least the grade of lieutenant commander.

the statement usually goes unchallenged. Yet most of us have encountered conspicuously proficient athletes who were, to state it mildly, not conspicuously successful officers. Some of us shrug off such experiences as exceptions which prove the rule, and others occasionally wonder whether the whole legend is fiction.

It therefore seems interesting to try to determine from available records whether it is true that success as an athlete at the Naval

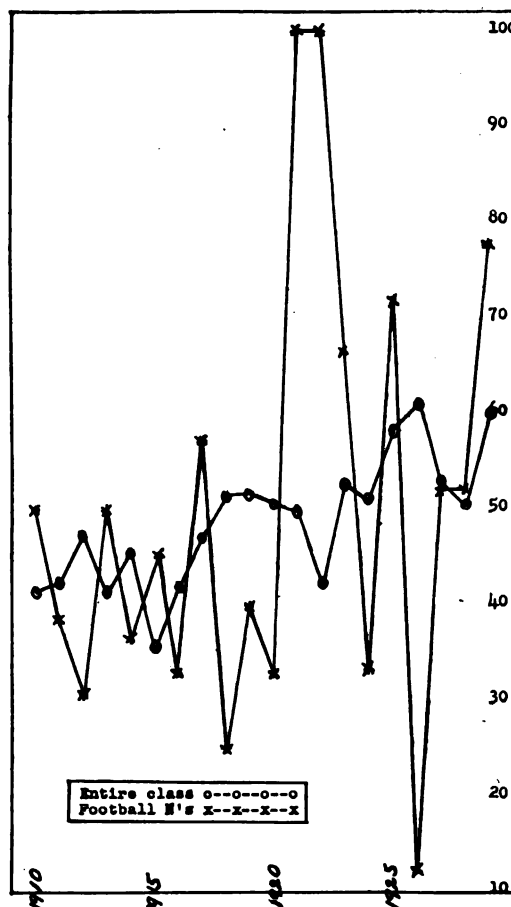


FIG. 2. Percentage of graduates reaching at least the grade of commander.

Academy indicates that the individual will probably be more successful as a naval officer than his contemporaries who do not achieve equal success on the playing field.

VICE ADMIRAL WRIGHT entered the Naval Academy in 1908 and served on active duty continuously for 40 years. In addition to the more usual naval duties, he served for two years as Deputy High Commissioner, Trust Territory of the Pacific Islands, and as such was engaged in administering the affairs of the people of the former Japanese Mandate.

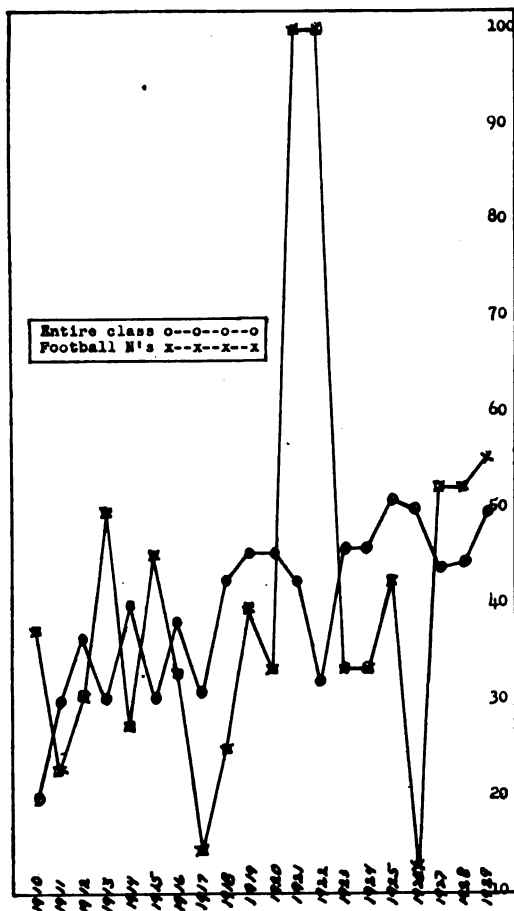


FIG. 3. Percentage of graduates reaching at least the grade of captain.

To facilitate statistical analysis, somewhat arbitrary standards of success have been adopted in the computations which were made for this purpose: the winning of an N at the Naval Academy is assumed to qualify one as a successful athlete; and the highest rank attained while on the active list of the Navy (including staff corps and the Marine Corps) is taken as the index of success as a naval officer.

With these criteria the records of twenty classes, beginning with the class of 1910, were examined. Data were obtained from the *Navy Register*, the *Register of Naval Academy Graduates*, and tabulations furnished by the Naval Academy Athletic Association. After some experimentation the best method of approach seemed to be to compute separately for each class the percentage of graduates who reached the various ranks. This was done for the class as a whole and then separately for the wearers of the N. Computations on flag rank promotions included only

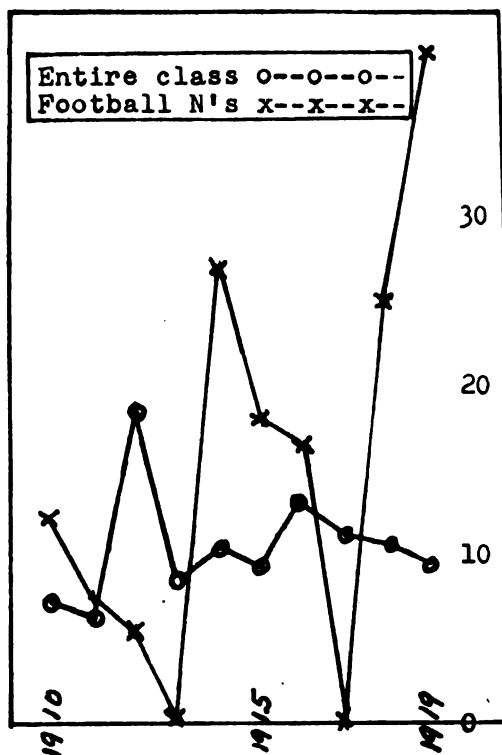


FIG. 4. Percentage of graduates reaching flag rank.

the first ten classes, inasmuch as further promotions in subsequent classes are still possible.

Since, in the popular mind at least, "athletics" means "football," the records of those who won their N's in football were examined first. The result is shown in Figures 1 to 4 inclusive.

Because of the small number of football players in a class, the curves show marked

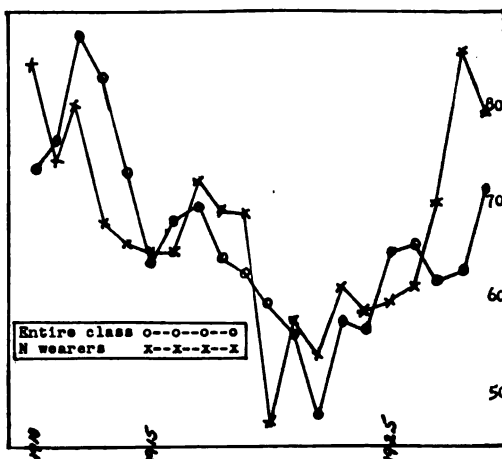


FIG. 5. Percentage of graduates reaching at least the rank of lieutenant commander.

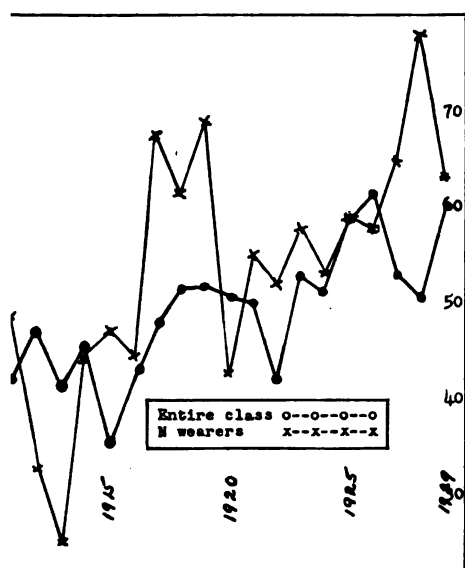


FIG. 6. Percentage of graduates reaching at least the grade of commander.

is and valleys, as might be expected. Examination shows that, so far as percent-promoted to lieutenant commander is concerned, wearers of the football N were more successful than the class average in the first half of the classes and less successful in the other half. The same is true for the grade of commander. The advantage was 12 percent against the football player for the rank of captain, and 6 to 4 in his favor for flag rank. This seems to be about as close to a fair result as it would be possible to obtain—and so far we have no evidence to back up the record.

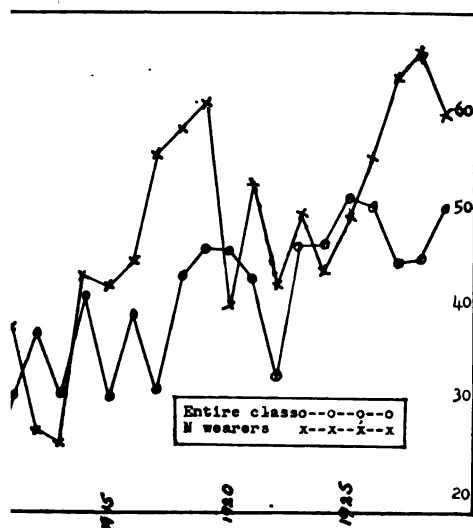


FIG. 7. Percentage of graduates reaching at least the grade of captain.

Of course athletics at the Naval Academy include a wide range of sports other than football. Navy N's are awarded for success in types of competition, such for example as rifle and fencing, which the public often does

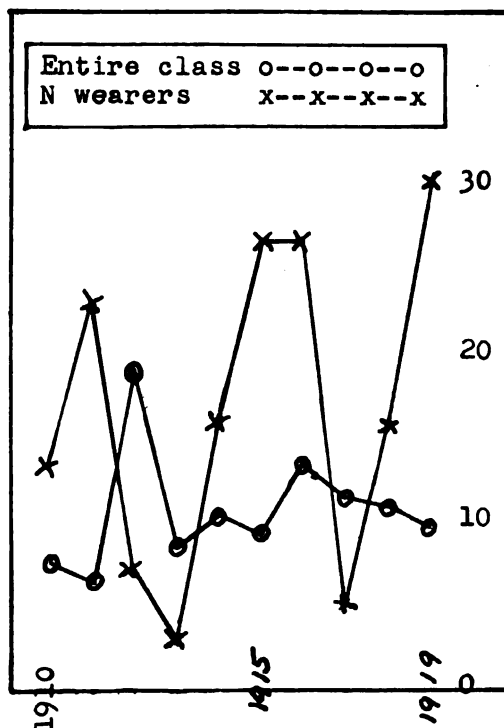


FIG. 8. Percentage of graduates reaching flag rank.

not include in its classification as athletics. Strange to say, computations for all wearers of the N give results quite different from the ones obtained for the football players, as shown in figures 5 to 8 inclusive.

It will be noted that although there are marked variations from class to class, the advantage here is distinctly with the athlete. The percentage of N wearers who reached a given rank exceeds the general class average in 12 out of 20 classes for the rank of lieutenant commander, 15 out of 20 for the ranks of both commander and captain, and 7 out of 10 for flag rank. This is too consistent to be mere coincidence. It seems to be quite conclusively indicated that the athlete who wins his N at the Naval Academy is a better bet as a successful naval officer of the future than his classmate who does not achieve equal success in athletics.

It is left to the reader to supply his own conjecture as to the reasons why the record of the football player should contrast so markedly with the experience of other athletes.



Official U. S. Navy Photograph

WAVE RECRUIT COLOR GUARD

"There are precedents for women in military service in both legend and history."

THESE BOOTS WEAR SKIRTS

By LIEUTENANT ROBERT A. ROGERS, III, U. S. Navy

"Jeanne appeared . . . clad in a new suit of brilliant white armor . . . with a lance in her right hand, which she had learned to wield with skill and grace."—SIR EDWARD CREASY

THE WAVE Recruit Training School, established with appropriate ceremony at the Naval Training Center, Great Lakes, Illinois on October 5, 1948, is training women, for the first time in the history of this country, not as reserves, but as recruits in the United States Navy.

The training area, Camp John Paul Jones, has a salty atmosphere. All day long one can hear feminine voices chanting cadence for marching feet. And the free use of such naval parlance as "hit the deck," "pipe men aboard," and "Seaman Recruit Doe reporting, Lieutenant," would no doubt bring a surprised smile to the lips of the great naval hero after whom the camp was named.

Public Law 625 directs that women shall be a permanent part of our armed forces. The law is not a concession to feminine whims; there are precedents for women in military service in both legend and history.

In Greek mythology Bellona, goddess of war, often accompanied Mars on his flights across stormy skies. She drove his chariot, parried thrusts of antagonists, and watched over his general safety.

The Odyssey relates that the fall of Troy was delayed by the timely arrival of Penthesilea, queen of the Amazons, who came to aid the Trojans with a band of female warriors. Having slain many of the bravest Greeks, she in turn was slain by Achilles.

In 1428 Joan of Arc, clad in armor and mounted on a war horse, led forces that broke the English siege of Orleans and saved the independence of France.

Florence Nightingale's work, as a nurse in the military hospitals of Balaklava and Scutari during the Crimean war, became a legend in her lifetime.

Colonial women shared many hardships during the Revolutionary War. Every school-

girl knows the story of Molly Pitcher (sobriquet for Mary Hayes), who carried water in a pitcher to hot, thirsty soldiers during the Battle of Monmouth in June, 1778. Another Revolutionary heroine, Margaret Corbin, accompanied her husband, an artilleryman, on all his campaigns. During the attack on Fort Washington (upper Manhattan Island) in November, 1776, she passed ammunition for his cannon. When he was killed, she took charge of his gun and continued to fire until she was hit by grapeshot and fell, seriously wounded. The first woman to be pensioned by the government, her body has been reinterred at West Point and a monument erected to her memory.

The Army Nurse Corps was established in 1901. The Navy Nurse Corps, established in 1908, was first suggested by a young Navy surgeon in 1811.

During World War I, women in many belligerent countries performed special services. In Great Britain they enrolled in nursing, voluntary aid detachments, and in various corps, including the Women's Royal Naval Service, popularly known as the WRENS. In the United States the Red Cross enrolled more than 23,000 nurses, who served in Army and Navy hospitals in this country, Europe, and the Near East. The Navy enlisted about 11,000 women, who served as "yeomanettes" and "marinettes," with full reserve status and specially designed uni-

A GRADUATE of the University of Florida and commissioned in the Naval Reserve in 1942, Lieutenant Rogers' assignments have included communications duties in the Third and Seventh Naval Districts, liaison duties with the Royal Air Force in the British West Indies, executive officer at naval air facilities in Cuba, as well as duty at the Naval Research Laboratory and on the staff of Fleet Training Center, Hawaii. Transferring to the Regular Navy in 1946, he is now attached to the Ninth Naval District Public Information Office, Great Lakes, Illinois.

forms. This was permitted by literal interpretation of basic Navy legislation, which referred to "persons," not "men." The Army would have requested revision in its legislation to permit enlistment of women if the war had lasted one year longer.

Russia, in 1925, introduced a military system providing for the voluntary service of women in time of peace, and compulsory service in time of war.

Far-flung operations of our armed forces in World War II created a tremendous need for combat personnel. This problem was solved when women, accepted for volunteer service in the Army, Navy, Marine Corps, and Coast Guard, released many physically qualified men for duty overseas.

The WAVES soon established their versatility and served with distinction in various shore billets within the United States and in the Territory of Hawaii. Their peak strength was approximately 86,000. Although the letters W-A-V-E-S mean "Women Accepted for Volunteer Emergency Service," the term WAVES is now traditionally associated with women in the naval service, and its use probably will be continued in the future.

Will the Navy's new women recruits be able to maintain the fine traditions established by the WAVES in war time? Before answering that question, let's take a close look at the "average" recruit.

Her home town is in the East or Midwest. She is 21 years of age; has brown hair and blue eyes; is five feet, five inches tall; weighs 125 pounds; and wears size seven-B shoes. After completing high school, she had six months additional schooling. Before enrolling in the Navy for its security, travel, educational advantages, and for new experiences, she worked as a typist, stenographer, or clerk. Her prime interest is naval aviation and her classification test indicates that she has aptitudes for this field. She likes all her courses, although her favorite is "Ships, Aircraft, and Weapons." She likes to march and drill and thinks military discipline is good for her. She likes Navy food. She is not afraid to express her opinions and does so, frankly and intelligently. She has good health and stamina and gets along well with other recruits. She is irritated by lack of time for customary personal things, but *her transition from civilian to Navy life is running smoothly. She is proud to be in the*

Navy and wants to make the Navy proud of her. Although her first enlistment is for three years only, she is giving serious thought to making the Navy her career.

Apparently the "average" recruit does possess the basic qualities of good health, intelligence, and proper attitude essential to success in the naval service. But the "average" recruit is only a composite of all the young women who comprise the first recruit training class. We can appraise the entire group with some degree of reliability, and also determine where they came from, their civilian backgrounds, physical characteristics, their aptitudes and interests, and why they enrolled in the Navy, by analyzing data obtained by polling 129 of the 160 members of the first training class.

The young ladies are from 28 different states. Pennsylvania is represented by 17; New York, 15; Michigan, 12; and New Jersey, 10. The remaining states are each represented by from one to eight recruits. Small towns and large cities are represented with about equal frequency.

More than 80 per cent of the recruits are in the age group 20 to 22. Approximately 40 per cent have blue eyes, 30 per cent have brown, and the remainder have green, gray, hazel, and black. Approximately 74 per cent have brown hair, 10 per cent are blondes, and the others have black, auburn, and red hair. The girls range in height between five feet and five feet, nine and three-quarters inches. About 80 per cent are in the group between five feet, two inches and five feet, seven inches tall, with an even distribution within this range. The extremes in weight are at 100 and 174 pounds, with an even distribution between 104 and 140. The frequencies are slightly greater at weights of 125, 130, and 140 pounds. Shoe sizes range from four to eleven, with significant frequencies in sizes six to eight; widths are from AAA to D, with C, B, and AA predominating in that order.

All of the recruits are high school graduates; 21 have had additional informal schooling; 35 have had one to three years of college; and 5 recruits have college degrees.

Their civilian experience was greatest in the fields of typist-secretarial and clerical, followed by telephone operators and students. Others include business machine operators, bookkeepers, X-ray technicians,

as, receptionists, welfare case workers, writers, artists, singers, ranchers, and others.

They joined the Navy for careers, education, travel, for new experiences, patriotism, duty, "to get out of a rut at home," prospects for a husband, "to be happy," to be a part of the Navy."

Their favorite training course is "Ships, Craft, and Weapons," but "Naval Personnel," "Naval History," and "Jobs and Training" follow in close order. A few like their courses in physical education, military drill, and first aid. Only two recruits dislike military discipline, and even they think it is necessary. Only one recruit hesitates to march and drill.

Like the recruits like Navy food, although they do not like certain dishes, and one said it is sometimes "too creamy." Another said, "Food's food."

The trainees are interested in every specialty available to WAVES, with Airman, Hospital Corps, and Personnel Man leading preference.

All recruits are given the Navy Basic Entry test. This test plus an interview, education and other background factors enables the classifier to determine the best schools for which they are best fitted. Members of the first WAVE recruit training class indicated aptitudes as follows: Airman (all aviation ratings authorized for WAVES), 28; Hospital Corps, 18; Yeoman, Communication Technician, 8; Radioman, 1; All test is supplemented by a radio code book, 7; Storekeeper, 7; Teleman, 7; Dental Technician, 6; Personnel Man, 6; Journalist, 1; Commissary Man, 2; Disbursing Clerk, 2; Photographer's Mate, 1. Tests were also given to determine aptitudes for Electronics Technician, Optical Man, and Printer-Operator, but no recruits qualified in these specialties.

Approximately one-third of the recruits say they plan to make the Navy a career; ten said "no." Others will stay in the Navy if assigned to their field of interest; others will decide when their present enlistment expires. Terms of enlistment are for one, four, and six years; all members of the training class enlisted for three years. The WAVE Recruit Training School,

otherwise known as Recruit Training (W), is a part of the Recruit Training Command. It is one of the many training activities at Great Lakes which operate under the overall command of Commander, Naval Training Center.

Recruit Training (W) occupies six buildings compactly grouped in a "main side" area. These include an administration and recreation building with administrative offices, a ship's service store, beauty shop, cafeteria and soda fountain, study hall, library, spacious lounge, game room, swimming pool, and gymnasium. Two barracks buildings provide quarters for 320 recruits, with one company of 160 recruits assigned to each. The sleeping compartments consist of cubicles equipped with two double-deck bunks and four lockers. In the galley and mess hall building well-balanced meals are served, cafeteria style, three times daily. Two other buildings are used for small stores and clothing issue, and for classroom instruction. Available outdoor facilities include drill and athletic fields.

The school's internal training and administrative organization is staffed by 12 WAVE officers and 14 petty officers. The battalion of 320 recruits is divided into two companies with officers as company commanders. Each company has four platoons with petty officers in charge. There are forty recruits in each platoon.

The curriculum includes naval history; naval personnel; naval organization; ships, aircraft, and weapons; Navy jobs and training; military drill; physical education; personal hygiene and first aid.

The academic courses are designed to provide a general background on the development of the Navy, its history and traditions; organization and administration of the shore establishment and fleet units; military courtesy, pay and allowances, courts-martial, discipline, ranks and ratings; types of ships, aircraft, and weapons and their uses.

The recruits learn standard Navy military drill without rifles. Physical training includes swimming, calisthenics, rhythmic activities such as folk dances, group games and individual sports. Personal hygiene includes instruction in proper grooming, good manners, and conduct.

All instructors for the academic courses are WAVE officers who were teachers in civilian life.

A constant check on the performance of each recruit is maintained by pop-quizzes, weekly and monthly tests, as well as a final examination. The battalion commander receives weekly reports on all trainees, covering military drill, personal appearance, and barracks inspection.

Results of the General Classification Test, adaptability to the recruit training program, and personal appearance are taken into consideration when selecting recruit petty officers. The ten recruits rating highest are nominated for such positions as platoon leaders, assistant platoon leaders, master-at-arms, mustering petty officers, and church group leaders. Recruit petty officers who fail to show desired leadership qualities are relieved of their responsibilities by other recruits who are next high on the leadership list.

Reviews and personnel inspections are held every Saturday; barracks inspections are made each Thursday morning.

The initial clothing issue for WAVE recruits consists of coats, blue, white, and seer-sucker uniforms, caps, gym suits, sweaters, dungarees, shoes, gloves, purses, and hosiery. In accordance with Navy policy, women recruits select and buy their own underclothing. They are not issued the short, white leggings which, long ago, gave Navy recruits the nick-name "boots." They are identified, as recruits, however, by a special shoulder patch. This consists of the WAVE device—a white anchor superimposed on a light blue ship's propeller—embroidered on a diamond shaped field of yellow felt.

Disciplinary problems, to date, have been insignificant. The demerit system is used in dealing with the petty infractions of rules that do occur, and cleaning of barracks during liberty time is the penalty usually imposed by the battalion commander.

The WAVE recruit has a busy life. After reveille at 0600, she has half an hour to dress, make up her bunk, and prepare for breakfast at 0630. Between 0700 and 0755, she polices her barracks, then musters for quarters, informal personnel inspection, and orders. Between 0800 and 1655, with a one hour break for food at 1200, she attends four academic classes; four other 45 minute periods are de-

voted to physical training, study, drill, and such administrative purposes as classification, hair cuts, inoculations, and sick call. The evening meal is at 1700. Mail call, showers, clothes washing, letter writing, mustering of the watch, intra-mural athletics, movies and other forms of recreation, fill the evening hours until taps at 2130.

This full schedule, involving 44 hours of instruction each week, is maintained in order to meet the requirements for WAVE recruit training established by the Chief of Naval Personnel. The Navy's long experience in training young recruits has proved that a program that is demanding, both physically and mentally, prevents homesickness and smooths the way for acceptance of discipline and the transition from civilian to Navy life.

All members of the school's training staff concur in the opinion that "the girls are of high caliber; they are keeping up in their classes; they are standing up well under the rigorous routine." They believe this is explained by the high standards required for enlistment. A girl must have at least a high school education, be over 20 and under 30 years of age, pass a physical examination, and be of good moral character.

Liberty is limited to six hours at the end of the fifth week, and twelve hours at the end of the seventh and ninth weeks. At all other times the recruits are restricted to their own training area. This is compensated for, in large measure, by a broad recreation program, which includes intra-mural athletics, movies, vaudeville, indoor games, a hobby shop, amateur shows, and "happy hours" for singing and skits.

After ten weeks' training, graduation ceremonies are held. The program includes a speaker, a recruit review, and presentation of awards to honor recruits.

Sixty per cent of the recruits go to Class A service schools. Forty per cent go to general service. WAVES are prohibited by law from serving aboard naval vessels except transports and hospital ships. It is anticipated, however, that a large number will eventually be assigned to naval activities overseas.

Rear Admiral J. Cary Jones, U. S. Navy, (now Commandant, Ninth Naval District) tells of an incident during the war which inspired a rumor that WAVES had been given billets afloat.

Commanding Officer of a carrier in the Pacific somehow acquired two WAVE recruits. A practical joker, he induced two recruits to board to put them on. The two recruits WAVES strolled winsomely about the deck, creating a sensation among all the Personnel on neighboring craft. Telescopes and binoculars on the deck of one man exclaimed excitedly that they recognized one of the "girls." With the realization that only scuttlebutt can attain on such occasions, it soon became common knowledge throughout the Pacific that recruits had been assigned to the fleet.

Objectives of the recruit training program, briefly, to effect a transition from civilian to Navy life; to provide a background of military service; to develop proper concepts of responsibility and conduct; to develop the idea of being a part of the Navy.

Are these objectives being achieved at Great Lakes? The answer is YES. But let recruits themselves confirm this in their own words. The question, "What do you think of recruit training?" Invariably frank recruits, their answers range from enthusiasm to unrestrained praise:

OK. I wanted discipline and I got it. Navy is a good life. It offers a lot and I get a lot in return. I'd like more discipline and recreation."

Recruit training is doing me a lot of good, I'm looking forward to graduating and going out as a 'salty sailor.' I hope that we all will be real sharp women of the Navy and men will be proud to have us as their wives."

Interesting and educational, but very hard times. Military training should be easy for all girls for a year or two." Good, except for the fact that I don't have enough time to keep my clothes in good condition to study."

I've learned to give and take and cooperate."

Good discipline and training, and character building. The officers and the training are excellent."

Thank that it is a wonderful test to see if or not I will make a good U.S.N. I hope to make my time in the Navy at Great Lakes and be proud of it, and also be proud of me."

Thank it's wonderful training for anyone

adjusting to Navy life."

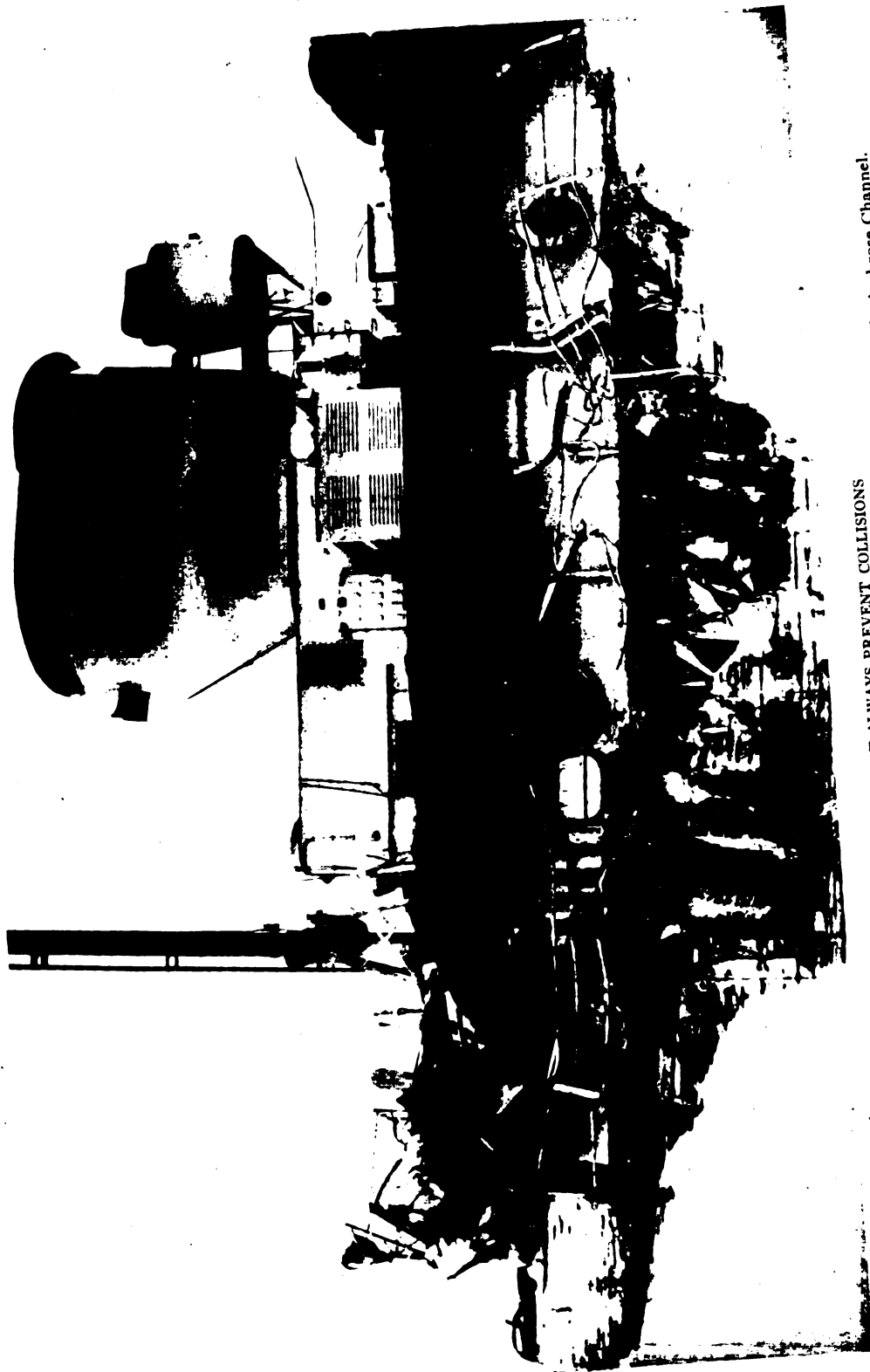
"My impression is that the Navy has accepted each and every one of us. We are her children, and she is going to make sure we are a credit to her."

"It's rough at times, but on the whole I like it. On the drill field this afternoon, I kept thinking, 'This is the life for me!' I really like the Navy and I want to belong. This indoctrination course is giving me that feeling."

In the past, women in uniform frequently were the butt of disparaging comments by male soldiers and sailors. For example, a visitor to Russia in 1917, while standing in a railroad station in Kronstadt, saw a member of the Women's Battalion of Death. She looked pleasingly military in her neat uniform, with spurs on her boots and a white fur cap on her head. A sailor, with the name of his ship, the *Pamjat Asowa* (named in memory of Asow, the revolutionist) on his cap, approached her and said, "Well, my officer in petticoats, who do you want to make war against now?" The girl's face turned red with embarrassment. As she walked quickly away, the sailor swore after her, "The devil take the wench!"

What is the sailor's attitude toward women in uniform today, and toward WAVE recruits in particular? The answer to this important question was given spontaneously by a Photographer's Mate, third class, on a Chicago radio station's "news-on-the-spot" program. He said, "They're tops in brains, and tops in looks, too!"

Some traditionalists still may contend that home-making is the only suitable vocation for women. But modernists will agree with the conclusions of the Congress, and with high-level Army, Navy, and Air Force opinion, that women do possess aptitudes needed by our armed forces; that they do have the qualities of loyalty, dependability, and spirit essential to military service. Those in doubt should visit the WAVE Recruit Training School at Great Lakes, stand in front of the administration building, and take a long, thoughtful look at the archway erected over the entrance. Freshly painted thereon are the proud words, "THROUGH THESE PORTALS PASS THE WOMEN OF THE GREATEST NAVY ON EARTH."



Official U. S. Navy Photograph

RADAR CANNOT ALWAYS PREVENT COLLISIONS
The radar-equipped U.S.S. *Nespelen* after collision with the French motor vessel *Indochinois* in a thick fog in Ambrose Channel.

RADAR, COLLISIONS, AND THE RULES OF THE ROAD

By LIEUTENANT COMMANDER JOSEPH K. TAUSSIG, JR., *U. S. Navy*

THE OFFICER of the deck of a vessel equipped with radar is often faced with the necessity of deciding whether or not affirmative action is necessary when an unidentified target is reported. The situation generally arises during periods of limited visibility or when running with darkened ship. The officer has at his disposal the three best tools for preventing collisions at sea: his judgment, the Rules of the Road, and the mechanical radar.

After the initial enthusiastic reception of radar and some twenty collisions later, the maritime world has gained experience which will allow some evaluation of radar as a navigational aid which will tend to place radar in its true perspective.

For the purposes of this article, collisions involving naval vessels have been used extensively as examples because they tend to bring home the problem of the officer of the deck. The mechanical aspects as affecting the use of radar as a navigational aid are treated first. This is followed by a discussion of what effect, if any, radar information should have on the navigator in following the Rules of the Road. Some of the examples are wartime cases; some of the actual radar in use are obsolete, but the problems which the collisions present are still present in varying degrees.

At first blush it is difficult for the uninitiated, and in some cases, the initiated, to comprehend how a vessel equipped with the magic eye of radar could come into collision with another ship. "Certainly the radar-equipped vessel should keep well clear," is the usual reaction. But the reader is reminded that already there have been two collisions in which *both* vessels had radar. In the normal situation the officer of the deck will not know whether the other vessel has radar or not.

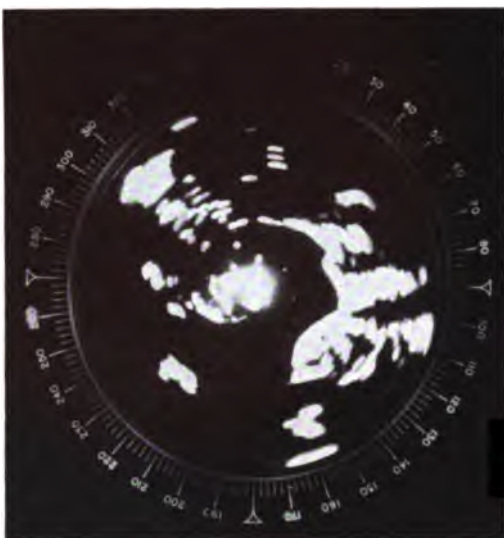
"Radar" itself, like "automobile," is a generic word. It covers a multitude of types,

each with its own limitations, variations, and designed functions. The Navy has had in use over one hundred marks and modifications of radar which today bear no security classification. The number of classified sets is unknown to the writer. Each of the unclassified models had differences important enough to differentiate it from other types.

Plate I shows the two basic types of display presented to the viewer. The first is the old "A" type display, now mostly obsolete; the second is the more modern "PPI" (Plan Position Indicator) display which eliminated many of the serious limitations of the "A" type. The PPI display gives the viewer a contemporaneous picture of the area around his ship. In general, his vessel is in the center of the plan, and targets show on the display in positions relative to his vessel.

Radar is not television. Plate II is a picture which was given wide circulation and publicity shortly after the security ban was lifted from radar discussion. The caption writer went overboard in his enthusiasm and has misled laymen into believing that radar can televise. Radar technicians themselves are not agreed as to what the picture itself represents or how it came about. The aircraft is between the viewer and the ground, but is so close that it has intercepted the radar wave either going from the antennae or returning, so that a normal echo is precluded. In any event, the picture is a freak. Plate III shows the display which can be expected from a modern set now generally in use.

A NAVAL ACADEMY graduate in the Class of 1941, Lieutenant Commander Taussig was seriously wounded in the Japanese bombing of Pearl Harbor, but returned to duty and has been on active service ever since. A specialist in maritime law, for the past year he has been Navigation Consultant for the Chief Admiralty Counsel of the Judge Advocate General, Navy Department.



Official U. S. Navy Photograph

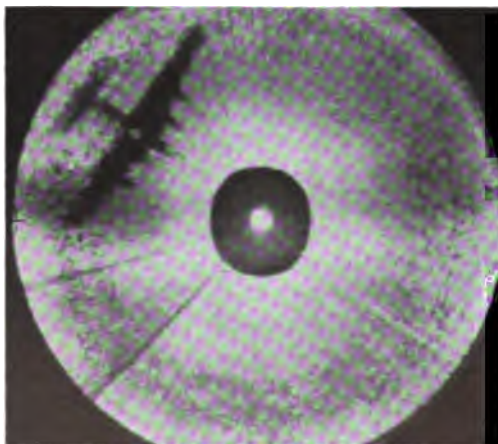


THE TWO BASIC TYPES OF RADAR SCOPE

On the right is the "A" Scope, where the range is determined by moving the depressed "step" until it coincides with the raised pip. On the left is a PPI Scope presentation taken on board a vessel in Tokyo Harbor.

Further, each individual type and instrument has inherent limitations on its range and bearing accuracy. This factor has played a part in many collisions. The resolution factors are of utmost importance in crowded or restricted waters.

The beam resolution of an average radar



Wide World Photo's, Inc.

RADAR IS NOT LIKE TELEVISION

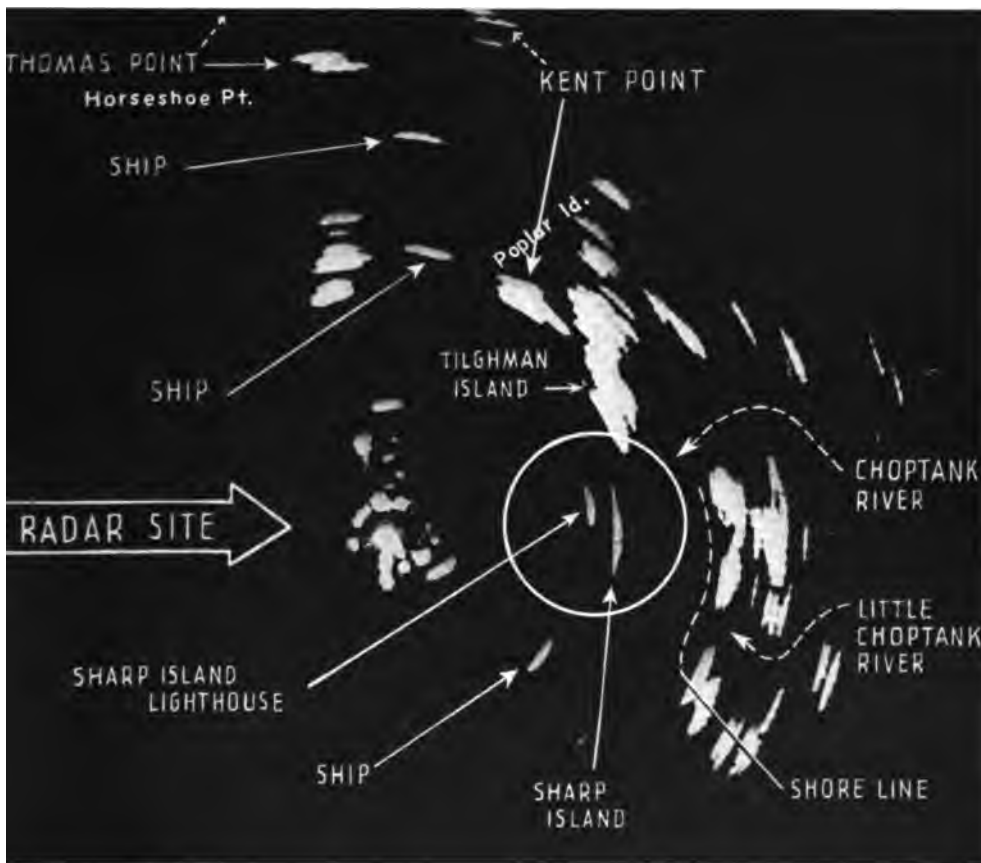
This picture represents the unusual event in which the target (a bomber) is so close to the radar antenna that it intercepts the beam and prevents it from echoing. If the proportion were correct relative to the radar scope, this bomber would have a two-mile wing span!

in use today is approximately 4 to 5 degrees and 50 to 100 yards. This means that if more than one object is present in the area included within the resolution limitations, the radar will not differentiate between them. They will show up as but one object.

Outside of the pure mechanics of the set is the personnel factor. Trained operators generally become better with experience. The scarcity of highly-trained personnel is unavoidable, but the mariner must bear this in mind: different operators have different acuities and abilities.

Collision cases are inherently complicated. In the following cases most of the discussion of the navigational features unrelated to radar have been omitted, unless they have some interesting or unusual features. The reader must bear this curtailment in mind. Some of the vessels in collision were not carrying the proper lookouts, were sounding improper signals, or were guilty of gross errors in judgment and errors of omission and commission, the recital of which would tend to make the analysis of each collision overly drawn out.

In the first litigated case involving radar, the Army Transport *Barry* was held to be solely at fault for colliding with a wooden



U. S. Navy Photograph

IT TAKES EXPERIENCE TO "READ" THE RADAR

PPI presentation of the area around the Naval Research Laboratory, Chesapeake Bay Annex, the lighthouse appears to be similar to a ship. Note the distortion of the pips in general.

shipping vessel, the *Medford*. The government stipulated that had the radar on the ship been in use, it would have located the vessel. On the basis of this stipulation, the court sounded the keynote of radar liability. The court did not say that if a vessel equipped with radar was in collision it was at fault, but it did warn that if a vessel had radar available in a fog, she should use it.

The first collision involving a United States naval vessel equipped with radar and a merchant vessel occurred in April of 1942. The U.S.S. *Wilkes*, escorting the U.S.S. *Itasca* in Massachusetts Bay, was struck by the British Motor Vessel *Davila*. The *Wilkes* had an SC-1 radar, with an "A" type of screen. The SC radar was de-

signed as an air warning radar, and was very crude according to present day standards. Accuracy was directly sacrificed for range and sensitivity. It was unable to resolve targets within 30 degrees of azimuth and 500 yards in range.

The data material to this discussion are as follows: The *Wilkes* was on course 000 degrees on a leg of a zig-zag. Her speed was 17½ knots. Visibility was good for lighted objects but was only about 1,000 yards for unlighted objects. The course lay towards Jeffrey Ledge, a fishing bank. The officer of the deck sighted steady lights slightly on the port bow at an estimated distance of 14,000 yards. He asked the radar operator to get an echo from these targets. The radar operator complied and verified the distance and the

bearing. Though no contemporaneous radar log was kept, the Commanding Officer of the *Wilkes*, who was on the bridge, vividly remembered that some time after the initial contacts, he received from the radar, information that a suspicious object was picked up at 030, distance 3,500 yards. Some time afterwards, the same target was reported at 030, distance 2,300 yards. A plot of these two bearings shows that with time intervals of one, two, and three minutes between the bearings, the target was crossing the bow of the *Wilkes* from starboard to port. The Commanding Officer, due to the presence of the reported object and the fishing vessels ahead, changed course to 070 and, because of the relative position of the *Augusta*, slowed to 15 knots. A few minutes after the course change, the M/V *Davila* loomed out of the fog and struck the *Wilkes* on the port side just aft of the bridge.

In order to demonstrate some extrinsic features which might enter into a collision case, the following is a summary of the situation on the *Davila*. The *Davila* was operating in a five-ship convoy on course 193 and speed 9 knots. She had a Chinese lookout on the port wing of the bridge, a Chinese helmsman, a sixteen-year old apprentice officer and the mate on the starboard wing. Her engine room telegraphs and light switches were inside the wheelhouse. The mate first saw the loom of the *Wilkes* about two points on the starboard bow. He told the apprentice to get the night glasses which were in the wheelhouse. Then he lit his pocket flashlight and flashed it at the *Wilkes* over the dodger. He then started for the wheelhouse and collided with the apprentice who was coming out. Extricating himself from the tangle, he noticed the *Wilkes'* port running light. He then entered the charthouse, *put the engines full ahead, ordered the rudder hard to port*, ran in front of the helmsman and then to the back of the wheelhouse to turn on his lights. They came on as the collision occurred.

In the instant case the dilemma of the *Wilkes* Commanding Officer was acute.

Radar was very new, untried, and unanalyzed from experience. A plot of the possible target positions (using knowledge gained from subsequent experiments) at differing time intervals, shows that the target,

assuming it was one ship or a group of ships, could have been on any course from 180 to 000, at a speed from dead slow to any practical speed. The convoy, in fact, was on a course and speed which barely passed through the possible courses from the plot, and far from the most probable course and speed of such a plot.

Other factors of navigation entered into the case, so the question of whether the collision could have been averted is impossible to answer. As far as radar is concerned, its presence in this case could only serve to further alert the *Wilkes* to the fact that there was possible danger to the north.

The practical lessons for the present day navigator shape up as follows: Each radar has inherent errors and resolution limitations which affect the accuracy of the reported range and bearing. Fortunately today, with radar specifically designed for surface navigation and with much more limited resolution errors, the extreme case of the *Wilkes* would not happen. However, the lesson remains, lessened only by the degree of accuracy between the *Wilkes* radar and the present day set.

A further example of inherent physical limitations of radar occurred in a collision off the Long Beach-San Pedro Breakwater at about 0745 on September 3, 1947, between the U.S.S. *Andromeda* and a barge.

The *Andromeda* picked up a pilot at 0736. The pilot stated to the Commanding Officer that on his way out he had seen a tug evidently towing. In fact, the personnel on the *Andromeda* could hear the fog signals of a towing vessel with a tow apparently off their port bow. The helm was put to port, and the radar operator was asked to see if he could locate a tug and a barge. As the *Andromeda* came to port, the fog signals apparently shifted over to the starboard bow. About nine minutes after taking the pilot aboard, the bow lookout reported a low lying barge dead ahead, and collision followed.

The barge was made of wood and had a very low freeboard. These two features combined to accentuate the extreme difficulty of locating a target made of wood as well as the difficulty of locating a target with a small effective reflecting surface. These two elements explain why radar technicians shud-

dered the day they read of the daring tug which navigated the Hudson River from 79th Street to the Ambrose Channel at 12 knots in a dense fog, using its radar. Once again the enthusiast went overboard for publicity which could well be a cause of future property damage or loss of life. The tug in the story was just lucky.

The collision between the U.S.S. *Corduba* and the S.S. *Joyce Kilmer* off the Virginia Capes in 1948 illustrated some further limitations of radar. The night was foggy. The *Corduba*, inbound for Norfolk on course 300, picked up a target bearing 299, distance 8,800 yards. Eight minutes later (other targets having been picked up in the meantime) the radar showed the original target bearing of 299 and a distance of 4,000 yards. On the strength of these bearings the *Corduba* came to course 320 and reduced speed from 11 to 4 knots. Eight minutes after changing course, the *Kilmer* loomed out of the fog and struck the *Corduba*.

The *Kilmer* had also been inbound for Hampton Roads, but because of the fog had decided to remain off the capes and find an anchorage. About eight minutes before the collision she had changed course to port in order to anchor on a small shoal.

The question naturally arises as to why the *Corduba* did not continue to take bearings on the *Kilmer*. In retrospect it is an easy matter to censure this failure. However, considering the fact that other vessels were in the vicinity and demanding attention after the course change, some navigational excuse can be found. But there were mechanical excuses too which are of great importance: (1) Each time the *Corduba* sounded her fog signal, the steam blast would cause the radar screen to blur and render it useless for an appreciable time; (2) the minimum effective range of the particular set was somewhere around 1,500 yards, due to sea return and atmospheric conditions.

These factors must always be considered. In some vessels the whistle blast will have no effect. Sea return is always present to some degree. It in turn depends on many factors such as height of antennae and structural design of the set, as well as the state of the sea. Sea return is basically a reflection of the beam off the water. The water echoes like

any other object, and it being all around the vessel, the screen near the vessel shows nothing except the solid water. Similarly heavy rain, snow, or sleet may reflect the beam and produce a "clutter" on the screen.

A collision involving elements of pure frustration occurred in the Ambrose Channel on May 27, 1948, between the U.S.S. *Nespelen* and the French M/V *Indochinois*. The *Nespelen* was making an outbound passage. The weather was foggy. Ambrose Channel is dog-legged and only about 650 yards wide. The officers on the bridge were discussing the distance to a buoy as they passed it to starboard. They asked the radar operator to affirm their estimates and he was able to pick the buoy out through the sea return, and reported it to be 150 yards abeam. This split the two estimates in question. As the operator commenced to sweep again, he immediately picked up a target at 7,600 yards entering the channel. The Commanding Officer changed course 5 degrees to starboard to get closer to the starboard edge of the channel. He did not dare go too close for fear of grounding on Romer Shoal. The radar stayed on the object, and in due time the *Indochinois* loomed out of the fog. The *Nespelen* went hard starboard, and then, seconds before the collision, hard port, in an effort to throw her stern away from the *Indochinois*. The *Nespelen* was hit a glancing blow just aft of the well deck. The location of the contact on the *Nespelen* was fortuitous, because the vessel was loaded with gasoline and a collision at or nearer the well deck might well have caused an explosion.

The speed of the *Nespelen* was four knots. The speed of the *Indochinois* was about $7\frac{1}{2}$ knots, according to the master and the pilot, because at a lesser speed the *Indochinois*, deeply laden, was sluggish and almost impossible to maneuver. Of course, she should have anchored outside the channel, but once committed to the passage of the channel, fate took over on the *Nespelen*. She had three choices: first, she could have tried to reach the safest course as close to the starboard side of the channel as possible; secondly, she could have attempted to get over on the left hand side of the channel; or third, as the office wag suggests, she could have backed down at $7\frac{1}{2}$ knots to the East River. She

chose the first alternative and nothing can be found amiss with the choice.

The radar aspect appears to indicate that the *Nespelen* was in a position from which she could not extricate herself. It is all well and good to look at a radar screen and see a vessel bearing down upon you, but when it is out of your power to attempt to avoid the collision except by actions *in extremis* it must be very trying on the soul. Actually, the radar was sensitive enough to pick up the buoys. It could also observe the relative position of the pip of the *Indochinois* with respect to the line of buoys, once it had actually started up the marked channel. But, here again, it must be remembered that radar does not give a television picture. All it could show were small blobs in a line, with a larger blob between them. The operator could guess whether the target was on the right or left of the center line, but even in the modern radar, the resolution is not so accurate as to tell the navigator within a one or two degree accuracy exactly where the target is. The center of the blob might appear to be a little to the right or left of the center line of the channel, and yet the target might actually be a little on the opposite side. Consequently it is impossible to tell exactly where the center line of the target is. In a narrow channel like Ambrose Channel, any bearing on the ship ahead will indicate a collision course, merely because the channel is so narrow that ships will have to pass within 500 yards of each other. Thus, the lesson from the *Nespelen* case involves the proposition that in a narrow channel, the best the radar will do is warn of the approach of a vessel, and getting over to the right hand side of a narrow channel is still the safest course, with or without radar.

A narrow channel collision occurred off Casablanca in February, 1944. The facts of the collision might well be set down as recreational reading. Radar played a relatively minor role in the instant case, but an important lesson can be drawn, even though it is a negative one. Basically three convoys and their escorts were involved. One convoy was inbound from sea, the other two outbound. The Casablanca Swept Channel was approximately 30 miles long and only about 1,000 yards wide. The outbound convoys were de-

layed by matériel casualties, so that by a collocation of circumstances, all three convoys happened to be traversing the channel at the same time. Nature took a hand in the matter by providing an intermittent fog which set in after the vessels had been committed to the passage. This type of fog is best described as "snakelike." That is, it was an extremely long narrow bank which zig-zagged as it moved.

The vessels involved were of many nationalities—American, British, Dutch, French, and a Yugoslav. The escorts were both American and French. Only the escorts had radar.

The channel buoys were spaced at five-mile intervals, and picket boats had been stationed to guide the vessels in the vicinity of the buoys. The radars appeared to be capable of picking up the land mass and roughly navigating from tangents taken on the land. The radar also was able to pick up some of the ships and distinguish them as ships. They were incapable, however, of keeping the convoys in line and ascertaining with any degree of accuracy on which side of the channel the convoys were operating, if, in fact, it could be ascertained whether the individual vessels of each convoy were not themselves so dispersed as to be on both sides of the channel. The vessels were supposed to be following in single file, but it is extremely doubtful that they were so doing, since as the events unfolded, very few of the ships seemed to have passed through the same waters as the ship ahead. All of the vessels and the escorts were sounding fog signals, and none of the vessels was in visual contact. The S.S. *Winsum*, leading ship of the incoming convoy, came to grief first. From ahead of her loomed the S.S. *Empire Tana*, the leading merchant vessel of the outbound convoy, and a collision ensued. The S.S. *Jaarstrom*, following the *Empire Tana* out of Casablanca, somehow got on the starboard quarter of that vessel and passed well clear of the *Winsum-Empire Tana* collision. Ten minutes later, however, she collided with the S.S. *Agen*, the third ship in the incoming convoy. The *Empire Tana*, continuing down the channel, then came into collision with the S.S. *Dunav*, the fourth ship in the incoming convoy, sinking this vessel. Meanwhile, the

Lookout Mountain, in the second convoy bound, was catching up with the others, she joined the melee by coming into collision with the S.S. *Shirrabank*, the second in the *Winsum* convoy. The total personnel casualties were a bruised hand, a cut and a compound fracture of the nose. From a navigational standpoint, a myriad of reasons enter into fixing the blame, if any. Obviously the initial confusion caused by the quickly disintegrated into chaos, once the *Sum* and the *Empire Tana* collided.

The radar aspects of the case, as indicated, are mostly negative. In the first place, navigating with radar by taking tangents from shore and points ashore is probably more accurate than celestial navigation, but not accurate enough to ascertain positions in narrowly marked channels. In the second place, unless a highly developed communication system is available, the information received from radar is almost impossible to communicate to the other vessels. In view of the different nationalities involved, the inability of whistle signals for warning (in the case of the numerous fog signals), and the infeasibility of the radar-equipped vessel doubling back and warning each vessel in advance (since the leading vessels were predicted to be following the wake of the escort), it would be tabbed impractical in this instance to disseminate the radar information even for the small amount of time it was worth.

The Casablanca fiasco leads into the highly important escort situation. While there is no question on the part of an escort to actively control the navigation of the escorted vessels, such a duty would be impossible to perform, there have been many occasions where a vessel in possession of radar information has been in a position to inform other vessels of the situation.

A collision occurred in the Caribbean Sea about 150 miles east of the Canal Zone on the morning of September 9, 1944. The S.S. *Woo* and three lives were lost.

The S.S. *Australia Star* was proceeding independently from the Canal Zone at full speed pursuant to orders. She picked up two targets on her radar at some eight miles. The targets were dispersed, and though no radar was kept, it is plain that the range closed, though there was a considerable divergence

as to whether the bearings remained steady so as to indicate a collision course with either vessel. When the nearest of the two pips reached about 4,000 yards, the observing vessel turned on her lights.

The two targets were a merchant vessel, the *Hindoo* and a Navy escort, the *PC-616*. The escort was zig-zagging ahead of her charge, which may account for the divergence of opinion as to whether she was on a steady bearing from the *Australia Star*.

The case was tried in the United States District Court for the Southern District of New York. It was held at the trial that the *PC-616* did not have an affirmative duty to warn the *Hindoo* of the oncoming vessel. The Circuit Court of Appeals reversed this holding, stating that since the *Hindoo* was subject to the orders of the naval escort, she could reasonably expect to be warned of any danger known to her escort which would require a departure from such orders. *Failure to so warn the Hindoo was held to be a breach of legal duty and a cause of the collision.*

This case stands as the law at present, despite the practical predicament in which it puts the wartime escort. The *PC-616* could not act until the *Australia Star* was identified. When she turned on her running lights, the choice lay with warning a blacked-out vessel that a lighted vessel was heading for her or warning a lighted vessel that she was heading for a blacked-out vessel. It further imposes a duty on the escort to supervise the actual navigation and prudent seamanship of the escortee. If the escort does not know whether the escortee sees the navigation lights of an approaching vessel, although they have been on for twelve minutes prior to collision, he is under a legal duty to warn the vessel and is responsible for any collision resulting therefrom.

So the law, as it stands at present, requires a vessel equipped with radar to warn the other vessels in company with her of approaching danger, even if she has reason to believe the danger is already known. Thus another aspect of radar navigation is written in the books.

On the plus side of the ledger there are innumerable unreported cases in which radar information has been effectively disseminated. Unfortunately the success stories are

often unpublicized because "nothing happened," and as a result valuable doctrines are hard to formulate from experience. One case was reported in the New York *Herald Tribune* on December 10, 1945, which is worth passing on.

During a fog on the Great Lakes a merchant vessel equipped with radar obtained two pips on her screen. Observing the relative movements of the two targets, the mate became convinced that the vessels were on collision courses. He was able to contact them by radio in time for both vessels to maneuver clear and avert a catastrophe.

On the other hand, the Proceedings of the Merchant Marine Council has reported two cases where both vessels had radar and yet came into collision. Apparently there were no mechanical considerations involved, or in any event they were not reported. Both situations happened to be head-and-head collisions. In both cases one vessel turned to port and the other turned to starboard. These cases naturally lead into the consideration of the question, "How should I maneuver, when I do not know what the other vessel will do or whether it has radar?"

Another case reported by the Council indicated that a radar antenna was offset from the center-line of a vessel so that a mast intercepted the beam. A vessel approached in this "blind" spot, was undetected, and collision resulted. Few naval vessels have these "blind" spots, but there is some analogy to the *Corduba's* whistle limitation.

At the present time it is better always to assume that the other vessel does not have radar. As soon as it becomes apparent that the vessels may be in danger of collision, common prudence dictates that action should be taken to avoid the situation. What action should be taken is dependent on many factors which cannot be listed exhaustively. In restricted or coastal waters a prime consideration is the possibility that the other vessel may change her course and speed; that land masses may appear like vessels; it must always be borne in mind that there are other vessels in the same waters which may have radar, etc. These factors indicate that good judgment must be exercised rather than the following of any set doctrine.

However, the Rules of the Road are not

superseded. Every vessel is bound to obey them.

The basic rules for the prevention of collisions in fog or decreased visibility (practically the only times when radar poses a different maneuvering problem peculiar to itself) require proper signals from every vessel, depending on the type of vessel, its employment, and whether it is underway with or without way on, or anchored, and the maintenance of a proper lookout. Certainly radar does not effect these requirements.

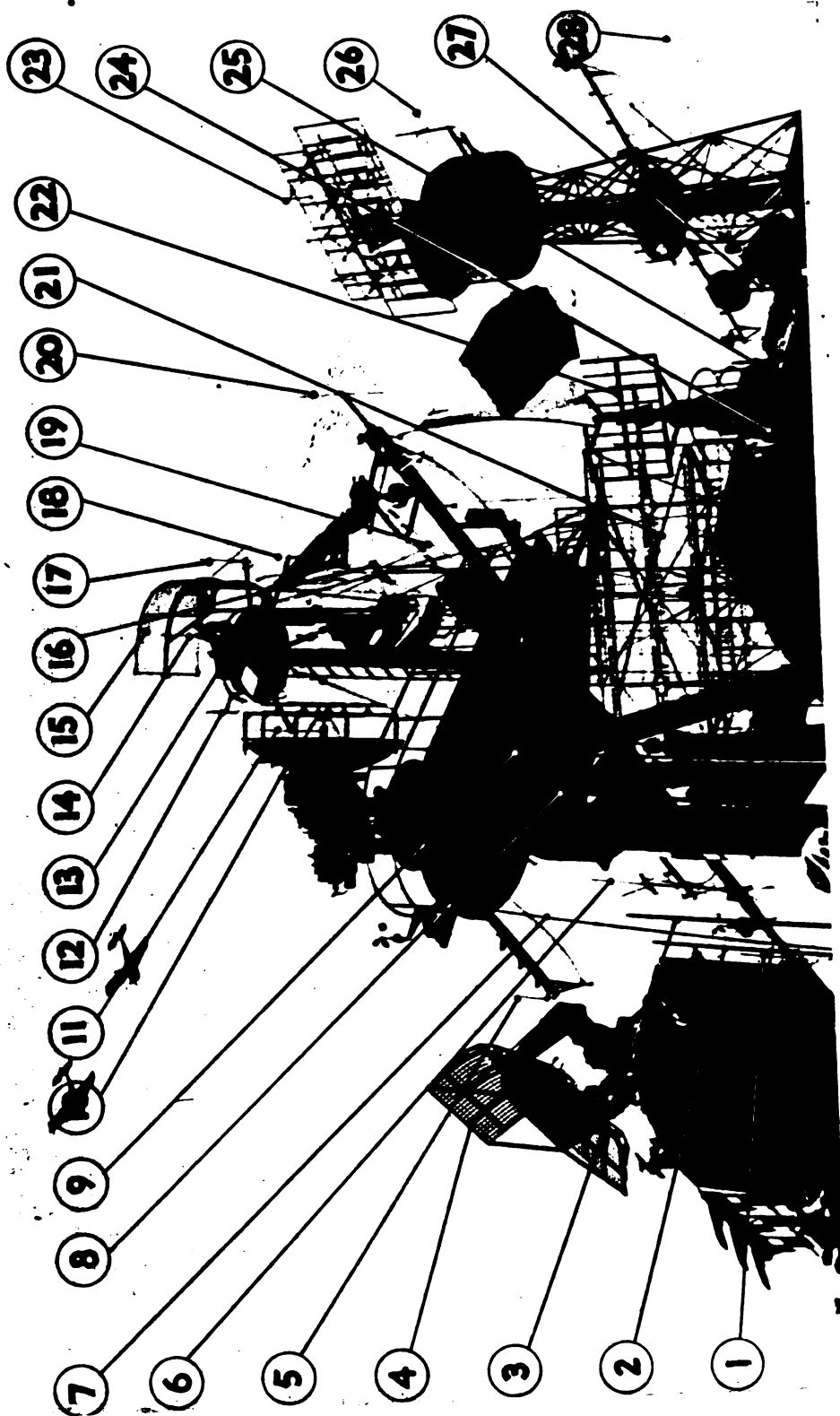
The other basic fog rule requires a moderate speed. Both the International and the Inland Rules require that:

Every vessel shall, in a fog, mist, falling snow, or heavy rain storms, go at a moderate speed, having careful regard to the existing circumstances and conditions.

A steam vessel hearing, apparently forward of her beam, the fog signal of a vessel *the position of which is not ascertained* shall, so far as the circumstances of the case admit, stop her engines, and then navigate with caution until danger of collision is over.

As simple as the rules are, collisions in fog still occur with tragic frequency because someone was not obeying their mandate. The courts, whose interpretations of the rules are as much a part of the rules as the words themselves, have written many opinions on what a "moderate speed" is. The consensus, and most conservative definition is: "A moderate speed is that speed at which a vessel can stop within one-half the range of visibility." The logic as a collision preventative rule is unimpeachable, but unfortunately, conformity in practice is not always feasible. Schedules, steerageway, military orders, current, unavailability of suitable anchorage, and other considerations make the mariner reluctant to proceed at snail's pace. The gamble is often disastrous.

Radar inserts another reason to dissuade the mariner from complying with the rules. The first part of the quoted rule requires a moderate speed under the stated weather circumstances. The second part applies when the position of the vessel is not ascertained. With radar, the position may be ascertained to the satisfaction of the officer of the deck—with the mental reservation that a low lying object may not show up on his scope. The



Official U. S. Navy Photograph

A FOREST OF ANTENNAE

Among the radar antennae on this modern carrier, No. 4 is a fire control radar; 10, 21, and 23 are air search radars; 13 is a surface search radar; and 15 and 22 are homing beacon radars.

moderate speed requirement should add to checking the impulse to proceed hell-bent-for-election through a fog. Preaching, however, will not make it so, and the average navigator will proceed at a greater speed through a fog if he has radar than if he doesn't. Accepting this premise, all that is left to do is preach! In any event, good judgment will dictate that once a fog signal is heard, the engines should be stopped and further movement should be cautious. Sea return and unexpected maneuvers will not excuse the vessel.

Analogies to the rules should be followed in taking early avoiding action. Based on reviewing in detail over one hundred collisions, and from conference with others who have spent years in reviewing collision cases, it appears that the instinctive maneuver of the mariner is to turn to starboard and decrease his speed. There is little wonder that this is the maneuver followed in most cases. The Rules of the Road in meeting situations require a starboard turn; the Rules in crossing situations require the burdened vessel to turn to starboard or slow down or both. In most narrow channels the starboard side is the proper side. The situations where port turns are required or desirable are rare in comparison to the standard turn to starboard. Of course, the unusual will happen and no set doctrine can be laid down as to the advisability of a starboard turn; but from experience, if the navigator has a choice and one turn is as good as another, the starboard turn will avoid trouble more often than a port turn.

A situation which does not occur to many naval officers but which carries over after the collision has occurred concerns documentary evidence of radar contacts. Aside from the aspect of military discipline after a collision there is a civil liability aspect.¹

Radar logs or deck logs with radar entries are valuable in ascertaining fault for col-

lisions, but only if written contemporaneously with the occurrence. Navy Regulations do not require that a radar log with target entries be kept, but the officer of the deck may make or break his case on what an entry shows. Similarly, the Navy Department often benefits from radar entries. In the *Corduba* case the radar showed that the speed of the *Kilmer* was over 7 knots, which was immoderate; in the *Indochinois* case the radar proved that the French vessel was proceeding at an average speed of at least seven knots, which again was immoderate. On the other hand, the "radar log" of the *Wilkes* was written up the day after the collision by an operator who at no time during his watch saw a clock, and who even logged targets appearing after the *Wilkes* had made its turn and there were none visible, due to sea return! It is easy to explain the log as such, but difficult to overcome its inferences, no matter how erroneous they are.

The conclusions to be reached from an analysis of the described collisions indicate that the definite limitations of radar must be borne in mind.

The mechanical limitations are:

- (a) Sea return and clutter, depending on type of radar, antennae height, and the state of the sea and atmosphere.
- (b) Bearing and range resolution, depending on the type of set.
- (c) Echoing efficiency of the target, depending on the material of which it is made and the effective echoing surface.
- (d) Extrinsic physical factors which may effect the radar such as whistle steam, and ship's structure.

The personnel considerations are:

- (a) The amount of training, personality, acuities, and abilities of the operator.
- (b) The ability of the officer of the deck to analyze the situation and evaluate the information which he receives.
- (c) The facilities and personnel available for plotting each contact.

The Rules of the Road must be considered:

- (a) Until sighting or hearing the other vessel the Rule of Good Seamanship (General Prudential Rule) and the Rule of Special Circumstances apply.

¹ Of more than passing interest to the naval service in this regard are the statistics on the amounts of claims paid and received through the Admiralty Counsel of the Office of the Judge Advocate General. For the first six months of the fiscal year, 1948-1949, the Navy paid out \$86,044.84 for damages caused by naval vessels, while it collected \$155,125.55 by virtue of damage caused by merchant vessels. These figures are exclusive of the amounts awarded by the courts in litigation.

- b) After sighting or hearing the vessel, unless collision is imminent, the regular Rules of the Road apply as if the radar were not present.

In general:

- a) Early avoiding action should be taken with due regard to the physical circumstances.
- b) All things being equal, the starboard turn offers the better of the choices if a turn is to be made.
- (c) Slowing down to steerageway will seldom cause any trouble, and will often avoid it.
- (d) Nothing can be lost by plotting each contact.
- (e) It is sound practice to disseminate information which you obtain from radar to other vessels who may be able to use it.



courtesy of the Proceedings of the Merchant Marine Council

SEA RETURN AND CLUTTER

Sea return and atmospheric clutter may completely obliterate the display in the vicinity of the vessel. This picture vividly represents one of the major limitations of radar for close-in work.



Official U. S. Coast Guard Photograph

THE SEAPLANE CAME INTO ITS OWN IN THE PACIFIC

Martin Mariners not only conducted long-range search and anti-submarine patrols, attacked enemy shipping, and fought off Jap fighters, but they were an integral part of the famous lifeguard and rescue organization along the bombers' routes to Japan.

LOW AND SLOW—MAKING SEAPLANE HISTORY

By LIEUTENANT COMMANDER R. R. BOETTCHER, *U. S. Navy*

AFTER many years of derision the patrol seaplane was finally, during the war in the Pacific, recognized by all pilots as a most useful and valuable creature. This realization came most forcefully to many as they or their friends were picked out of an inhospitable sea by a flying boat which landed for that purpose. This phase of the airplane's activity was, however, only one of many and by no means the most important of an extensive repertoire.

The seaplane came into its own during the invasion of Okinawa. In the words of Commander Fleet Air Wing One, "Never before had search planes and tenders attempted so much under such difficult combat, weather, and base conditions." And the attempt was successful beyond all but the wildest hopes! Long before fields were available for the first land based aircraft, the seaplane organization had established a large, protected, and well supplied floating base from which operations were established days before the initial landing on Okinawa had taken place. For a period of weeks the only long range planes in the area were the Martin Mariners from Kerama Retto, the group of small islands about 15 miles west of Okinawa proper.

The record of Patrol Bombing Squadron Eighteen is one that illustrates the versatility of the seaplane and the success it achieved when flown by pilots and crews who had faith in their airplane and ability to use its every advantage. This squadron of Martin Mariners (PBM-5) was assigned at Okinawa to the search and reconnaissance group composed at first of only two squadrons, VPB-18 and VPB-21. The mission of the patrols flown by these units was to search out enemy shipping and attempt to destroy it, and to locate and report the presence of any enemy attacking force threatening the invasion fleets. The area covered included the China Sea, the Yellow Sea, the southern end of the Japanese Sea, the east coast of Kyushu and

Shikoku, and the fleet operating area east of Okinawa. The hunting along the north China coast and the ruggedly indented west coast of Korea was very good and the success of the slow and relatively undergunned Mariner as an attack bomber was a surprise to all but its crews.

Other Mariner squadrons were assigned the duty of maintaining a constant anti-submarine patrol about the invasion area. The success of their effort may be realized in the fact that, to the best of this writer's knowledge, not one enemy submarine attack during the whole operation met with success.

Virtually every type of mission performable by a patrol seaplane was assigned to VPB-18 at one time or another, and they were flown in weather up to and including a typhoon. Routine reconnaissance patrols were the most numerous. In addition, anti-shipping block missions, night heckling and intruder flights into the confined waters of the Empire itself, night convoy tracking missions, and attacks against defended radio, radar, and lighthouse land installations were undertaken. One flight was made for the purpose of dropping "surrender" leaflets to the enemy forces occupying one of the islands surrounding the seadrome. Specific search and attack missions against shipping were also flown, and the squadron frequently acted as an air-sea rescue outfit. Squadron policy was to attack any target the pilot thought he could get away with, and it was

A GRADUATE of the Naval Academy in 1940, Lieutenant Commander Boettcher served in the cruiser *Tuscaloosa* and the carrier *Hornet*. After completing flight training he spent six months in anti-submarine patrol off Brazil. He commanded VPB-18 during the Okinawa operation. Later he served under the office of Naval Intelligence in the Joint Army-Navy-Air Force Intelligence Division. He has just completed a three-year post-graduate course in Aeronautical Engineering.

carried out with vigor and enthusiasm by all concerned.

Although enemy aircraft offered the greatest hazard in the air, a great many difficulties were encountered, and overcome, at the base. The area was protected from the sea, but ground swells could and did enter the seadrome to make the heavily loaded take-offs most difficult and hazardous. Small craft insisted, under the cover of darkness, upon anchoring in the runways, and many take-offs were made on a dog-leg around a careless LCI with the plane bouncing from the crest of one swell to the crest of the next. These same LCIs also insisted upon testing their protective smoke-laying apparatus just as the morning or evening flight of planes were maneuvering for take-off positions through the maze of shipping bordering the runways. This unexpected smoke was the cause of one collision between two planes which resulted in "strike" damage to one of them. In addition, the surrounding islands were still in enemy hands, and since some plane moorings were almost within throwing distance of the beaches, an armed guard had to be maintained on each airplane at all times. This later developed into one of the most pressing problems encountered, as it became impossible to maintain the security watch on as many as 18 planes, fly the schedule required, and still permit the crews to get some rest aboard ship. Naturally, the rest aboard ship went by the board.

Another most serious problem was unique to Kerama Retto. Due to the number and variance in air attacks upon the shipping in the anchorage, no plane, friendly or enemy, was permitted to enter the area while an attack was in progress, and the daily attacks sometimes lasted four to six hours. This unavoidable policy frequently forced planes with engine trouble, or with an engine failure, or with battle damage to keep clear of the area until the attack had ended. A plane from another squadron was forced to land outside the area one night, and the landing attempt was unsuccessful, killing the entire crew.

In March, 1945, Patrol Bombing Squadron Eighteen had been in the forward area for ten months and had faced very difficult operating conditions but no sign of the

enemy. The squadron was at this time at Saipan readying planes and equipment for the move to Okinawa. On the night of March 28, the twelve twin-engined Mariners took off from the Saipan lagoon and in three-plane sections started climbing up through the overcast on a heading of northwest. In addition to a full load of ammunition for the eight 50-caliber machine guns and a full load of bombs, each plane carried the personal effects and equipment of its crew, as this was also a squadron movement. Apprehension also rode in each plane that night. Although two squadrons had moved forward the night before, this was still a flight into the unknown with no return.

The apprehension was justified as one plane soon suffered an engine failure. Fortunately the pilot had enough altitude to permit him to jettison his ammunition, bombs, personal effects, and anything else that could be torn out of the airplane, and was able to struggle back to Saipan on one engine to make a successful night landing in very rough water.

The remaining eleven airplanes plowed their way through the storm and arrived at Kerama Retto at dawn on March 29. The tenders were anchored as planned and looked surprisingly peaceful. Planes from the earlier squadrons were moored and the seaplane base was well established. The planes in the air landed and moored to buoys laid the day before. The crews then took a short boat ride to their home, the seaplane tender U.S.S. *St. George*, where they were greeted by the remainder of the squadron, six crews who had stayed with the ship. That night the first of the many long range patrols was sent out.

During the following months of April, May, and June the squadron flew a total of 5,065 hours. Until July 11, 236 day patrols, 159 night patrols, and 27 special missions were flown with an average of 15 crews and 16 planes. In the course of these flights twelve enemy aircraft were destroyed in the air and nine others damaged. Seventy-six attacks on enemy surface craft (100 gross tons or more) netted 44 (24,560 gross tons) sunk and 32 (19,000 gross tons) damaged excluding numerous junks, sampans, and lesser craft destroyed and damaged. Varying degrees of damage resulted from attacks on 24

installations, while 20 rescued aviators testify to the pilots' rescue ability. Three anti-shipping patrols met with extraordinary success despite the fact that one with disaster. On the morning of May 5, Mariners left Kerama Retto on a routine dash up into the Yellow Sea and through islands forming the west coast of Korea. It was in the latter area that they succeeded in finding and sinking four ships—three smallers and one small freighter, each in a different devious channel—for a total of 1,000 gross tons. Effective AA fire was rendered by all but one of the ships, and one of the Mariners was riddled although the crew was untouched. On June 14, two other Mariners returned to the same area in the vicinity of Fusan for a repeat performance on a smaller scale, sinking three sea trucks, three luggers, probably sinking a fourth truck, and seriously damaging three others. The third record patrol was flown on June 15 in the Tsushima Straits area. This was the "hottest" sector flown and the search planes were almost invariably attacked by enemy fighters. This day the "Big Boats" found and sank a sea truck and a medium freighter (4,000 tons) in the straits and a large freighter (3,500 tons) was sinking. It was then that one of the Mariners was severely hit by return anti-aircraft fire which badly damaged one engine. The plane was immediately lightened by dropping the remaining bombs and all machine gun ammunition in excess of 200 rounds per gun, the absolute minimum for warding off the expected opposition. Returning to base with a damaged engine almost stopped, the planes were suddenly attacked by at least ten enemy fighters. At the start of the minute running battle which ensued, the damaged Mariner and a determined enemy fighter shot each other down. During the action the other Mariner later shot down at least four more Japs and damaged others before the enemy broke off the action. At that time the faltering engine stopped altogether and the plane was forced onto the extremely rough water with its empennage completely shot away. The crew was unhurt; all but three men were able to leave the plane in rubber boats. After staying afloat for 12 hours they were rescued by a coura-

geous submarine guided to the scene, two miles from the enemy shore, by another squadron plane. One man then had his arm broken when the submarine's bow plane crashed down onto the rubber boat in the very heavy seas. The three men left behind on the plane were not heard of again, although the area was searched for days for survivors.

Two flights were noteworthy in that they featured the PBM in a new and unfamiliar role, that of combat air patrol over friendly shipping. On April 6, two Mariners returning from a day anti-shipping sweep encountered an enemy air raid proceeding towards Okinawa. After reporting to base they engaged several of the enemy aircraft and shot down three, a Hamp, a Val, and a Kate, with only slight damage to themselves. On May 4, a similar encounter took place just after two PBM's had taken off for a routine patrol. Finding an enemy raid in progress over Okinawa they joined the fray and shot down one Kate and one Nate and damaged two Zekes which tried to intercept them. At the conclusion of this affair both planes continued on to give full coverage to their assigned search sector. Probably one of the longest individual air actions of the war took place the day another Mariner was on routine patrol and surprised an enemy torpedo plane. The two planes, it soon became apparent, had equal top speeds, and the PBM had to chase the enemy about 75 miles across Tsushima Straits before its bow gunner finally shot the Kate down.

An attack made by one Mariner resulted in unknown damage to the enemy, but was a fine example of the aggression shown by some of the pilots. The squadron had for some time been given the task of destroying a large enemy radar station perched on the top of a 1,200 foot hill on the China coast. Much to the pilots' chagrin, however, the target was completely hidden by fog for many days. On this day the fog finally lifted and obscured only the top of the hill and the target. Deciding not to lose even this long awaited dubious opportunity, the PBM made its attacks by flying just beneath the fog level until it neared the hill. Pulling up sharply into the fog at that point it was able to fly over the target at a very low altitude.

The enemy, nevertheless, was able to get lined up with his AA long before the PBM pilot or his gunners could see the target, and as a result a warm reception greeted the plane as soon as it came within range. Not to be deterred, however, the Mariner made three separate attacks with bombs and machine guns before it was forced to retire, badly holed. Again the crew was lucky enough to escape without injury.

Planes from another squadron on a patrol along the east coast of Kyushu one day seized an opportunity which seemed to present itself and proceeded inland along a small waterway to completely demolish with bombs and fire a small shipyard.

VPB-18 also made some rescues worthy of attention. On April 2 while on a day shipping block mission southwest of Kyushu one of its boats made an open sea landing and picked up three survivors of a downed carrier TBM and then proceeded on his patrol. On April 12 another PBM of the squadron effected a similar rescue of a downed fighter pilot off Okinawa. Although high seas and a structural failure damaged its starboard engine mount, permitting only half its normal power to be drawn from that engine, the Mariner's pilot made a very skilful semi-circular take-off and nursed his plane back to base. On May 7 a similar landing was made in the Yellow Sea off the Korean coast and the entire crew of a PB4Y Privateer, 13 men in all, was rescued. Light enemy surface units were close enough for a ringside seat but did not prevent the rescue. Another PBM also landed at sea one day while on routine patrol, picked up three survivors, and continued on. Each of these landings was made against Fleet Air Wing One policy which considered an open sea landing and take-off by a plane heavily loaded for offensive action a poor risk. Criticism was withheld if the attempt was successful, but the wrath of the gods would have descended upon the unsuccessful pilot who then would also have to be rescued along with his crew and the original survivors.

Inevitably, combat success of this sort demands its price, and VPB-18 was not excepted. On May 6 Lieutenant Collins, whose record as a skilled and daring pilot was unequalled in the area, was instantly killed

when an enemy Kamikaze plane hit the squadron tender, the U.S.S. *St. George*. Lieutenant Prudden was almost fatally burned at the same time. On May 15 Lieutenant (jg) Marr and his crew and three others were lost. On June 28 a plane on night patrol suffered a complete and immediate engine failure when a fuel line broke as the plane was flying at low altitude made necessary by weather conditions. Recovery on single engine could not be made and Lieutenant (jg) Podlogar and three members of his crew did not succeed in swimming away from the crash. The others were found and rescued eight days later. Another PBM pilot should have required a rescue when he had an engine shot out at a very low altitude while making a normal attack on a picket vessel. Exhibiting outstanding skill and ability he kept his plane in the air and flew back to base 540 miles away on one engine.

In July the U.S.S. *St. George* was ordered back to Guam for the repair of the damage suffered when the Kamikaze hit her in May. VPB-18 was to be left without a home, so the squadron was ordered back to Saipan on July 11 for rest, training, and recreation. Many of the original squadron crews had been relieved by rotation crews by this time, but only the most aggressive were sorry to leave Kerama Retto.

At Saipan, after a short period of relaxation the squadron engaged in long range anti-submarine patrols, night anti-submarine blocks, air-sea rescue missions, and a daily flight to enemy-held Marcus Island. In addition, for the first time in three and one half months training of the new crews could be done outside the active combat zone.

After the hostilities had ended and it was decided that the fleet would enter and stay in Tokyo Bay, VPB-18 received orders to convert its planes to cargo and passenger carriers. This was done and during the month of September this squadron operated the "Tokyo Express," a daily flight between Saipan and Tokyo of from one to four planes carrying cargo and passengers. For maximum safety, keeping the total weight below the single engine maximum, not more than 7,500 pounds of cargo or 22 passengers and 8 crewmen was carried. This load was normal, and by October 3, when the service was

ended the "Express" had carried a total of 594 passengers and 387,370 pounds of mail and priority cargo. Only three flights were cancelled due to adverse weather and one plane returned to Saipan with a malfunctioning engine. On more than one occasion for periods of one to three days the "Tokyo Express" was the only air service entering or leaving the Tokyo area. All personnel took justifiable pride in this record and were rewarded by having a representative with the fleet in Tokyo Bay when the articles of capitulation were signed on the U.S.S. *Missouri*.

After the naval and military air transport

services took over the Saipan to Tokyo shuttle service, the squadron duties became less arduous. Shortly thereafter the squadron received orders to proceed to Hawaii and then to the West Coast to decommission. The squadron correspondence, records, and gear were loaded into the planes along with personal equipment and the long move to the U. S. was uneventful. On December 8, 1945, after having carved a well-earned niche in naval aviation history, Patrol Bombing Squadron Eighteen was decommissioned at the Alameda Naval Air Station across the bay from San Francisco.



GUN SALUTES

Contributed by REAR ADMIRAL A. FARENHOLT (MC), U. S. Navy (Retired)

In the old Navy the matter of gun salutes was always a very touchy point. John Paul Jones on his first arrival in France not only made most careful inquiry of the local French Admiral at Quiberon regarding a return salute, but, after giving a salute late one day outside the harbor, he sailed through the French fleet the next morning and fired and received another salute "just to make sure."

On shipboard the firing of a salute was a very important affair. There were no small saluting guns used until quite recent times, and the main battery, sometimes with reduced charges, sometimes with full, was so employed. With the big 9-inch smooth-bores of a ship such as the large steam frigate *Wabash* of forty guns, with fourteen in each battery of the gun deck being fired alternately from forward aft, the sight and also the sound must have been magnificent.

The Executive officer, then usually called the First Lieutenant, took his station and at the proper moment gave the signal to the Gunner, standing amidships forward, to commence firing. This he did with the order, "Number one starboard, fire!", followed after the proper interval by, "Number two port, fire!", "Number three starboard, fire!", and so on to the end of the salute.

To get the proper interval and to insure the firing of exactly the correct number of guns was as important in those days as it is today. Gunners were divided as to the most efficient methods to be used, but the one most frequently employed was the formula, repeated half to himself and half as an order after the first gun, "If I wasn't a gunner I wouldn't be here—number two port, fire! . . . If I wasn't a gunner I wouldn't be here—number three starboard, fire!" And so on.

The transfer of the proper number of beans, one at a time, from one pocket to another was a customary method to insure the correctness of the tally, although the tearing off of strips of paper or the throwing down of a match were also popular. This brings us to the particular consideration of the famous Captain Joseph Fyffe, U. S. Navy, commanding some vessel, somewhere—I suspect in the Mediterranean.

It became necessary for him to fire a twenty-one gun national salute to the British flag, and this was promptly done "ship-shape and Bristol fashion." Hardly had the reverberation of the last gun died away before a boat, flying the saluted flag, was reported "heading this way, Sir." It shot alongside and a dapper young Lieutenant came on board and requested permission to speak to the Commanding Officer. Once in the cabin he introduced himself as an Aide to the Port Admiral and stated that he had been instructed to inquire why the American ship had fired *twenty-two* guns.

This news—for the additional gun had been unnoticed on board—must have taken the redoubtable Captain Fyffe badly aback. However his quick-wittedness, as usual, instantly came to his relief. And, shaking his finger at the young Britisher, he replied: "I fired twenty-one guns for Queen Victoria and one gun for Mrs. Joe Fyffe, by God!"

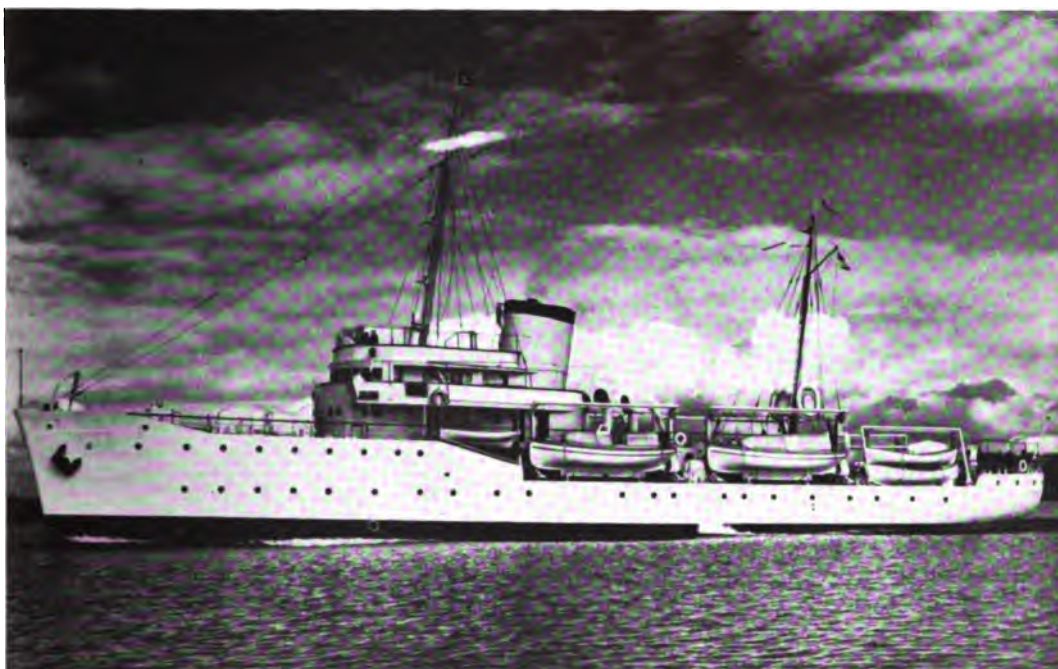
(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS.)



Courtesy Coast and Geodetic Survey

MATERIAL REQUIRED IN THE MAKING OF ONE NAUTICAL CHART

To show all available information necessary for safe marine navigation, charts prepared by the Coast and Geodetic Survey are published in relatively small editions based on extremely detailed data, and must be constantly revised to keep up with the man-made and natural changes in coastal waters.



Courtesy Coast and Geodetic Survey

U. S. COAST AND GEODETIC SURVEY SHIP *EXPLORER*

Equipped with the latest electronic devices, the *Explorer* is the most modern of the vessels making hydrographic surveys for the Bureau.

THE COAST AND GEODETIC SURVEY

ORGANIZED in 1807, during the administration of President Thomas Jefferson, as the "United States Coast Survey," the Bureau began operations in 1816 and, except for periods between 1818-32 and 1834-36, has carried on its functions without interruption. Through the years since its inception added responsibilities have been assigned to the Bureau, including the extension of geodetic control surveys into the interior, and the compilation and publication of U. S. aeronautical charts for air navigation purposes.

Besides its seismological service and the compiling of magnetic data and tide and current tables, the work of the Coast and Geodetic Survey falls under four general headings. Its Marine Service includes the compilation and publication of nautical charts, coast pilots, and distance tables. Its Aeronautical Service not only publishes

charts of the United States but also distributes charts of foreign areas to civil aviation. A third division is the production of topographic and planimetric maps based on aerial photography and used in the preparation of both nautical and aeronautical charts. The final division is the Geodetic Service. These operations include the determination of latitudes and longitudes by triangulation and traverse; the determination of elevations by leveling; astronomic observations for latitude, longitude, and azimuth in conjunction with triangulation and traverse; and gravity observations for determination of the figure of the earth.

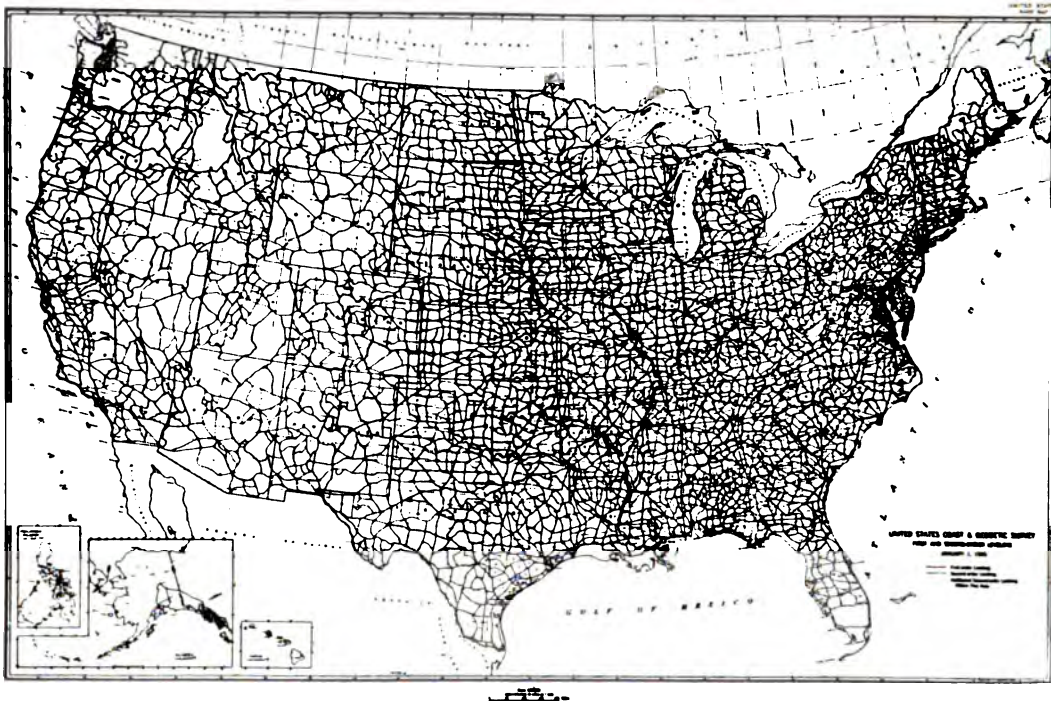
Thanks to the publications of the Coast and Geodetic Survey for American waters and of the Hydrographic Office of the Navy for foreign waters, it may be said that the American mariner enjoys the finest cartological service in existence.



Courtesy Coast and Geodetic Survey

TRIANGULATION NETWORK OF THE UNITED STATES

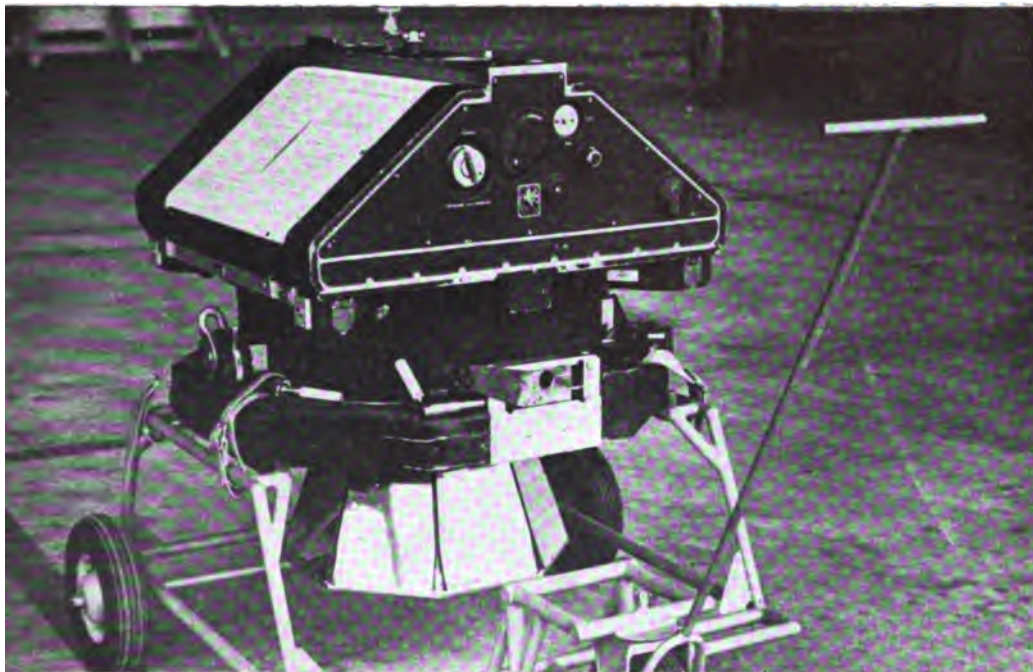
This map shows the triangulation work completed by the Coast and Geodetic Survey to January 1, 1946. The geographic positions have been determined for approximately 135,000 stations in the United States and Alaska.



Courtesy Coast and Geodetic Survey

LEVELING NETWORK OF THE UNITED STATES

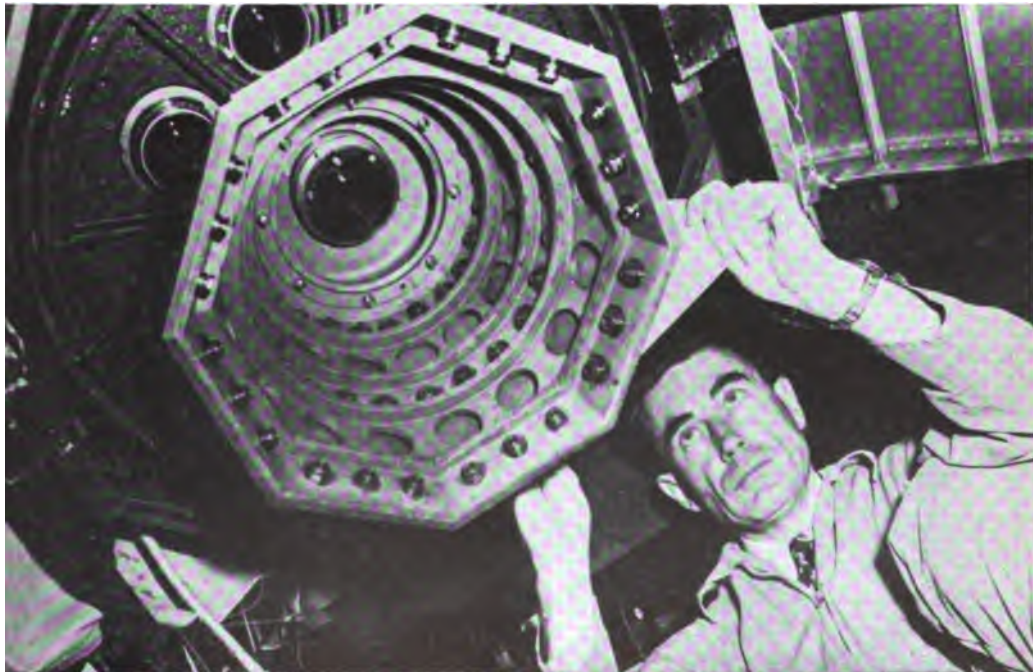
The first and second order level lines in the United States are indicated as established by the Coast and Geodetic Survey to January, 1945. Bench marks are set at one to two mile intervals along these lines for use in making contour maps and to furnish elevations for engineering projects.



Courtesy Coast and Geodetic Survey

NINE LENS AERIAL CAMERA

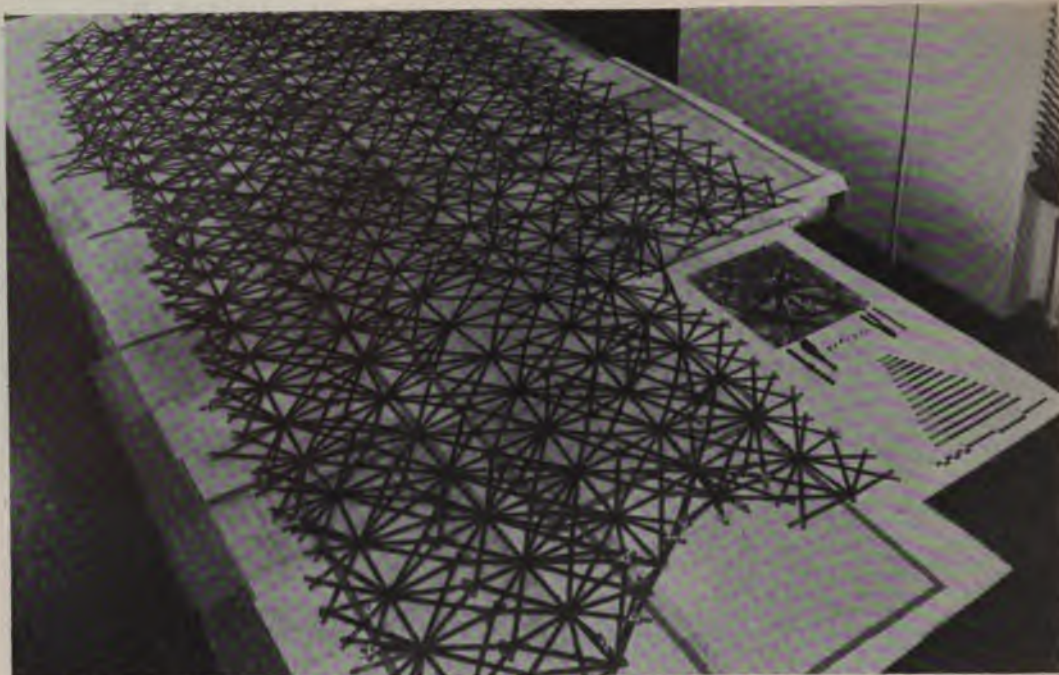
Since 1927, aerial photographs have been used by the Coast and Geodetic Survey. This nine lens camera is used for obtaining topographic data to be employed on nautical charts and for making airport surveys.



Courtesy Coast and Geodetic Survey

NINE LENS CAMERA AS INSTALLED

The Bureau maintains its own personnel and photographic equipment. Data obtained is employed in planimetric mapping, and for other publications, including the aeronautical charts of the United States with which all naval aviators are familiar.



Courtesy Coast and Geodetic Survey

METAL-SLOTTED TEMPLATE PLOT

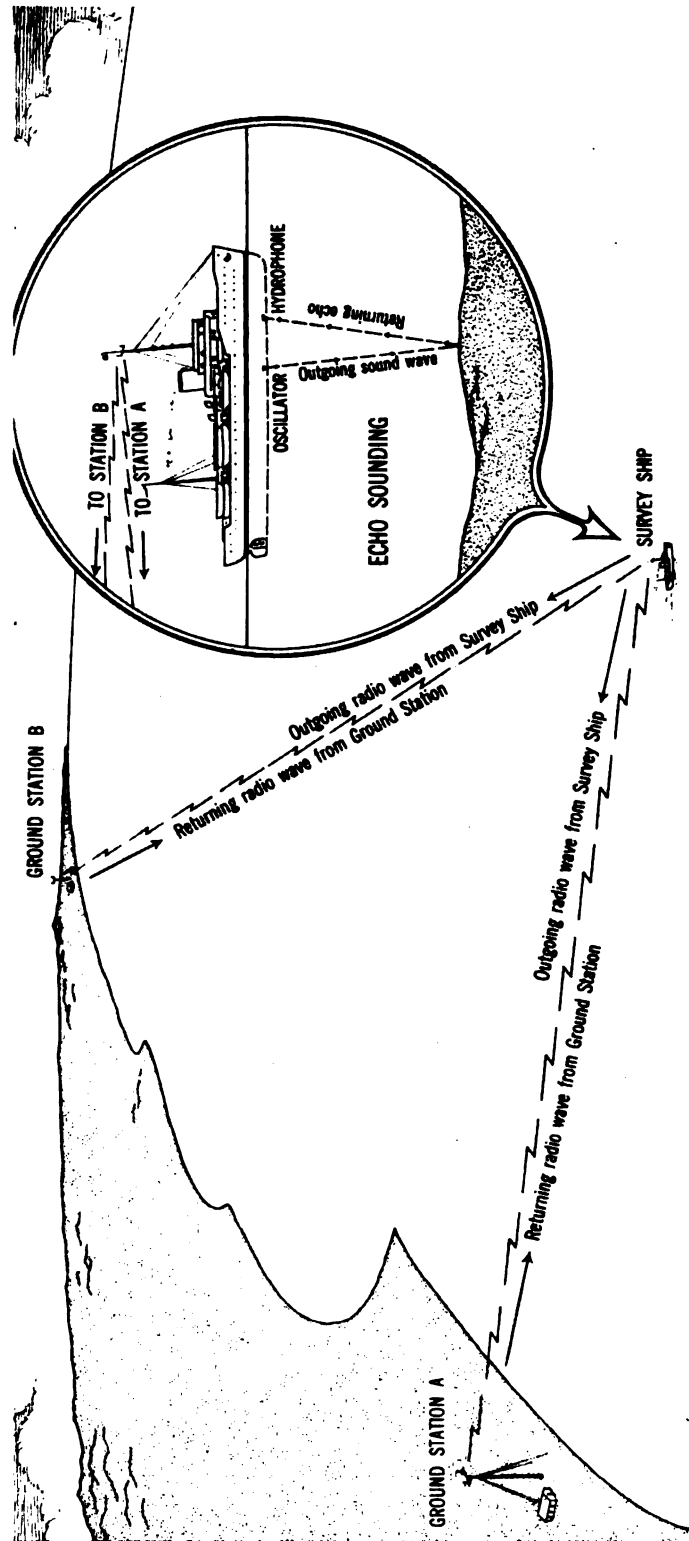
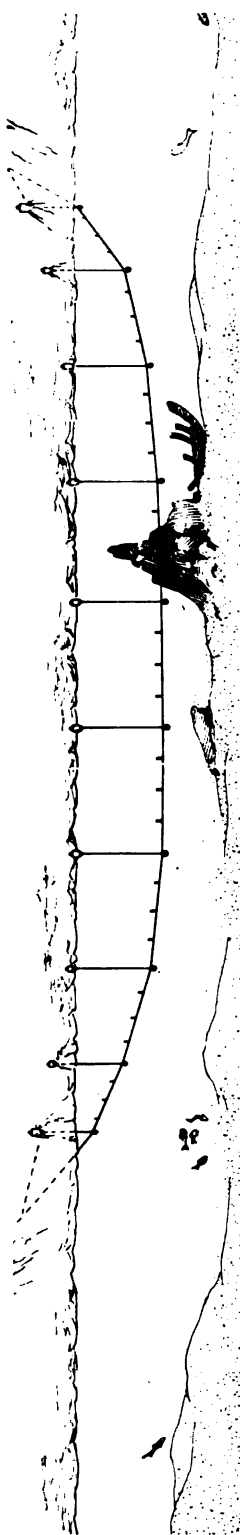
A graphic triangulation net is shown above by which aerial photographs are used to obtain the positions of a multitude of closely placed points, which in turn are used to control the compilation of topographic details which collectively constitute the map.



Courtesy Coast and Geodetic Survey

MULTIPLEX AERO-PROJECTOR

Transparent slides made from a strip of overlapping aerial negatives are placed in the projectors, which are then adjusted to occupy positions corresponding to the relative successive positions of the airplane as the strip of photographs was taken.



Courtesy Coast and Geodetic Survey

TWO METHODS OF HYDROGRAPHIC SURVEY

The top diagram illustrates the use of the wire drag, up to 15,000 feet in length. Supported at an adjustable depth by buoys, the drag locates sunken rocks and other obstructions. The lower diagram illustrates the use of electronic devices. Shoran, Loran, or Racon is used for determining position, dependent on the distance of the ship from the stations, so that both correct water depths and the exact position of such depths may be accurately obtained.



Courtesy Coast and Geodetic Survey

TIDE GAGE AT ANCHORAGE, ALASKA (LOW TIDE)

From this seven and a half foot depth the tide will rise to about the forty-two foot mark. The Tide and Current Tables, familiar to all naval officers, are, of course, publications of the Coast and Geodetic Survey.



Courtesy Coast and Geodetic Survey

SETTING UP THE PROJECTIONS RULING MACHINE

Sailing Charts scales are 1:600,000; General Charts are from 1:100,000 to 1:600,000; Coast Charts are from 1:50,000 to 1:100,000; Harbor Charts are from 1:50,000 to as large as 1:10,000; and Charts for the Intracoastal Waterway (Inside Route) are on the scale of 1:40,000.



Courtesy Coast and Geodetic Survey

VERIFYING FIELD SHEETS FOR A NAUTICAL CHART

Detailed hydrographic surveys have been made since 1834 for the entire coastline of the United States and the Territory of Alaska, as well as other insular possessions of the United States. The resulting field sheets provide the basic chart data.



Courtesy Coast and Geodetic Survey

SETTING TYPE FOR USE ON CHARTS

Type composition, rather than hand lettering, is employed by all modern chart and map makers. Various type faces are employed for the maximum legibility, significance, and uniformity. Several special processes have been devised just for chart and map work.



Courtesy Coast and Geodetic Survey

IN THE PROCESS PLATE MAKING ROOM

Like paper currency, charts represent a high level of technical skill and craftsmanship in the art of reproduction. Note that the plate is being scrutinized under magnifying glasses. Such skillful care has come to be taken for granted by the navigator.



Courtesy Coast and Geodetic Survey

ERECTING A BILBY TRIANGULATION TOWER

This portable steel tower, used by field parties in geodetic control surveys, consists of two tripod structures. The inner structure supports the theodolite; the independent outer structure is for the observer and recorders, or light-keeper.



From An Old Print

SURRENDER OF CORNWALLIS AT YORKTOWN

Shown here is the French Fleet whose control of Chesapeake Bay prevented the British from either reinforcing or evacuating Cornwallis's beleaguered army.



DISCUSSIONS COMMENTS NOTES

Ancient and Modern Aspects of Sea Power

(See page 1351, November 1948 PROCEEDINGS, and
page 228, February 1949 PROCEEDINGS)

CAPTAIN W. D. PULESTON, U. S. NAVY (Retired).—In the February issue of the PROCEEDINGS, Professor Daly asserts that Spain was represented at Lepanto by only thirty-one galleys. Actually Philip II, who was Duke of Milan, King of Sardinia, Sicily and Naples, as well as King of Spain, furnished fourteen Royal galleys from Spain, ten from Sicily and thirty from Naples; in addition to his regular naval galleys he hired twenty-five from Genoa and other cities: a total of seventy-nine galleys. Daly also asserts "Of some 28,000 soldiers, 8,000 were Spanish and German and the balance (20,000) were Italian." Actually Philip provided 8,000 Spanish, 5,000 German, and 5,000 Italian troops, totaling 18,000. The Pope furnished 1,500; Venice, 5,000; in addition 4,000 noble adventurers accompanied the fleet. In extolling the Venetian galleasses Daly omits to mention that during the approach to battle they were lagging far behind and the utmost efforts of Don John could only get four out of six into their prescribed stations in the van. Nor does Daly mention that Spain furnished twenty-two and Venice only two sailing men of war called "nefs." Each of these carried 125 soldiers and 40 sailors, with fleet supplies of all kinds including siege and field guns in case landing operations were necessary. Through misunderstanding of orders these ships were not present at Lepanto but they were contributed by Philip.

So much for Daly's statements and omissions about Lepanto; in addition he implies that all Christian galleys were equally efficient. Admiral W. L. Rodgers reports that

the Venetian ships were "somewhat weak, short of soldiers and even rowers. Venetian galleys averaged 75, Papal 130, King Philip's 145 soldiers." Don John had difficulty in persuading Veniero, Venetian Commander, to accept from him "1,500 Spaniards and 2,500 of the King's men." Further, Rodgers writes that the Spanish ships were in excellent shape, well provisioned, and fully manned; so were the Papal ships, but the Venetian were deficient in material and discipline as well as numbers. It is true that the Pope blessed the fleet, that contingents from Papal, Venetian, and other Italian (geographically) States participated in the campaign; but to imply that Lepanto was not essentially a victory over the Turks by Spanish ships and men will leave a false impression upon a casual reader. W. L. Langer in "An Encyclopedia of World History" refers to Lepanto "as the outstanding event in the long naval duel between the Spaniards and Turks."

Professor Daly's mistakes are probably due to his considering the Spain of Philip II as being limited to Iberian Spain. But long before the union of Castile and Aragon under Ferdinand and Isabel, Aragon had conquered Sardinia, Sicily, and Naples—almost half of present day Italy. Merchants from peninsula Spain traded with Hansa merchants in Bruges via Biscayan ports, and with Levantine merchants via Barcelona and Sicily. Not even Venice had accomplished such an expansion of commerce. By 1492, eighty years before Lepanto, the Spaniards, tempered and disciplined by "their long war with Islam," had become both "a military and a sea-going people."¹ The difference be-

¹ *History of Europe*, pp. 485-492. By Henri Pirenne.

tween Spain and Venice is convincingly shown by the haste with which Venice made a secret peace with Turkey after the victory of Lepanto in 1573, and by the immediate reconstruction by Philip II of the Spanish Fleet after the destruction of the Armada. In 1589 "the British Isles were again threatened by invasion."²

Philip had been carefully trained for his royal responsibilities by his father, Charles V, and at his accession he "was the most powerful monarch in the world." Although a bigoted Catholic, he did not consider that he was responsible for suppressing heresies outside his own dominions. Nor did he subordinate the interests of Spain to the Vatican. In the early years of his reign he supported Elizabeth and Protestant England against Catholic France, and continued hostilities against France when she was an ally of the Holy Father. Philip, like his father, disposed of the Clerical patronage in his dominions, thus using the vast revenues of the Church for national policies. I did not imply that Philip "understood the use of a navy" as fully as it is today. But he had a clearer concept of sea power than Elizabeth and Lord Burleigh, her most influential advisor. Philip utilized his men of war to protect the Flotas when they were first attacked by French privateers, reinforcing the naval escorts at the Azores much as was done in the last two World Wars. He used his fleet and expeditionary forces to exterminate French Huguenots who settled in Florida and South Carolina, and his successor, Philip III, intercepted one of three of the ships carrying English settlers to Jamestown in 1607.

But as pointed out in my article, the rise of the Dutch Navy that was destined to break Spanish control of the Atlantic had already commenced. At Lepanto the Spanish Navy had passed its prime, that of Venice was in eclipse. Portugal had dealt Venice a death blow when she gained control of the Indian Ocean by defeating the Moors off Bombay in 1509.

Professor Daly also criticizes my account of the American Revolution for not giving enough space to the French Navy. I sum-

marized the consequences of French intervention, giving full credit to the Fleet for gaining temporary control of the Chesapeake and west Atlantic and thus ensuring the surrender of Cornwallis. It would have required a volume to describe and explain in detail the previous French failures at Delaware Bay, Sandy Hook, Newport, Boston, and Savannah. I was also taken to task for only giving three hundred words to the French Revolution and Empire. The account was correct if brief and emphasized how sea power caused the downfall of Napoleon, the greatest Soldier-Statesman that had arisen in Europe since Julius Caesar.

Captain W. M. James' *The British Navy in Adversity* is Daly's selection for "the standard work on the American Revolution." It is a very good book. James had the advantage of Mahan's accounts of that war and followed Mahan's method of presentation as first given in Chapters IX through XII of *The Influence of Sea Power Upon History, 1660-1783*, published in 1889. In 1913, Mahan published them in a separate volume entitled *Major Operations of the Navies in the War of Independence*. James added nothing to Mahan's account except corroborating details of corruption among British politicians, dissensions among naval officers, and amplifications of land campaigns particularly in the southern states. Sir W. L. Clowes thought so much of Mahan's treatment of that war in his first book that he invited the American author to contribute a chapter "On The Major Operations of The Royal Navy 1762-83" to the history of the Royal Navy which he edited in 1898.

James was so completely in accord with Mahan's theme that he employed similar verbiage. Thus James in his introductory chapter writes, "The naval student will see in it (war for American independence) the beginning of a truly maritime war, such a war as in its later phases evokes memories of de Ruyter and Tourville." Writing *thirty-seven years earlier* Mahan said of the same war, "We have come therefore to the beginning of a truly maritime war, which . . . has not been seen since the days of de Ruyter and Tourville." Be sure I am not accusing a distinguished naval officer and a brilliant student of plagiarism. No one could write as in-

² *Statesmen and Sea Power*, p. 17. By Admiral Sir Herbert Richmond.

telligently as James did of the naval operations 1778-83 after Mahan's book without consciously or unconsciously using the same approach.

I am not acquainted with Mr. Price's study of the blockade of the South by the Union Navy. It did not seem necessary to offer proof of a fact so universally admitted as the length and effectiveness of that blockade.

Typhoons and Birds

(See page 635, June 1949 PROCEEDINGS)

MISS DOROTHY FORD MAYHEW.—Lieutenant Lauer, in his article "The Typhoon Lady," in the June 1949 PROCEEDINGS, mentions that the *San Jacinto* had the rare experience of passing through the eye of one of the typhoons that dogged her cyclonic career. It would be of much interest to know if anyone recalls whether there were birds, specifically land birds, in the storm center.

It may happen, when such an atmospheric disturbance passes close enough to a coast, that birds are picked up by the winds and blown into the center, in which they are then imprisoned and, if the storm fails to strike inland, are carried to sea, eventually to die from exhaustion or drowning.

This is probably a fairly frequent occurrence—whenever a cyclonic storm follows a track which would bring it about. But, understandably, there is very little empirical data available concerning it. Relatively few ships ever have the misfortune to be caught in the eye of such a storm, and no sensible navigator would deliberately take his ship into it, even for purposes of scientific investigation.

Moreover, to find birds in the "eye," the storm would have to be encountered at some point in its course *before* it had traveled long enough and far enough for its unwilling passengers to have succumbed to hunger, thirst, and fatigue. Of course, too, it would have had to skirt a coast somewhere, close enough for winds of great violence to sweep some distance inland. Unless, to be sure, there had been a flock of land birds migrating over water that had become involved in it.

The chances, then, of human observation of this phenomenon are extremely few, and anyone who has had the exceptional oppor-

tunity of witnessing it might make a valuable contribution to science by making his observations known, with all possible detail, including snapshots or sketches, if any were made.

The writer, who once did have this rare experience during a West Indian hurricane in 1933, only recently realized how very much such information is wanted. A brief note contributed to the magazine *Science*, in connection with a discussion of the various influences affecting bird migration, elicited an inquiry from Dr. Robert Cushman Murphy of the American Museum of Natural History, wanting greater detail, more exact identification of the birds, and, if possible, photographs.

He also referred to a chapter in his own book, *Oceanic Birds of South America*, in which he deals with the subject, as well as the corresponding occurrence of sea birds being carried to remote inland regions in the same way. It was noticeable how little hard data he had to cite, and also how anxious he was for even such scraps of additional information as could be furnished.

Lieutenant Lauer's mention of the eye of the typhoon suggested that there might be more potential sources of information among the subscribers and contributors of the PROCEEDINGS than could be reached through any other medium. To be useful, it should include not only everything that might have been noted about the birds themselves, their condition, numbers, kinds, and particularly whether any one kind predominated, but also as much as possible about the storm, point of origin and path followed, wind speed and rate of advance, proximity to land at any time, and, of course, date and seasonal data.

Dr. Murphy is especially interested in linking these occurrences with his studies of bird migration, and while such an involuntary mass displacement could not in itself be considered a migration, it would be important to know whether the birds had been migrating at the time they became involved.

(EDITOR'S NOTE: Here is an opportunity for naval officers and other readers of the PROCEEDINGS to make a real contribution to Science by contributing information to Dr. Murphy, just as so many sea captains furnished invaluable information to Matthew Fontaine Maury for his famous researches on wind and ocean currents.)



British Official Photograph

FIGHTING THROUGH TO MALTA

A British convoy under air attack in the Mediterranean. Why the Germans failed to seize the British sea bastion is one of the questions answered in the book *Hitler and His Admirals*.



BOOK DEPARTMENT

Both regular and associate members of the Institute may save by ordering books through the Book Department. A discount of 10% is allowed on books of other publishers (except on foreign and government publications and on books on which publishers do not give a discount). Allow reasonable time for orders to be cleared and books to be delivered directly to you by publishers. Address Secretary-Treasurer, U. S. Naval Institute, Annapolis, Maryland.

HITLER AND HIS ADMIRALS. By Anthony K. Martienssen. New York: E. P. Dutton & Co. Inc., 1949. 267 pages, 5 maps, 8 photographs. \$4.00.

REVIEWED BY CAPTAIN J. M. P. WRIGHT,
U. S. NAVY

Naval actions, planning and policy are usually enmeshed with the personalities, politics and economy of any country whether it be a dictatorship or democracy. This normal state of affairs as it applied to Nazi Germany is revealed in an easily readable style in Mr. Martienssen's brief history of the German Navy in the recent war. Through the medium of captured documents—Hitler's conferences with C-in-C Navy, Staff War Diaries, and personal files—the secret discussions and political maneuvering that preceded the Nazis' operations are skillfully presented. The author shows how the top Admirals, Raeder then Doenitz, not only directed naval affairs but frequently assisted the Dictator to plan his over-all strategy.

The influence exerted by C-in-C Navy on the leader of a primarily land fighting nation is interesting. It was logical that Hitler listen to his Admirals as he had engaged to fight with the leading sea power of the world. It was unfortunate that he did not always follow through on their counsel and consequently on such occasions failed to at-

tain his objective. For example the "Grand Plan," to drive through Egypt to India, was advocated by Raeder and probably would have succeeded if Hitler had not reneged on the capture of Malta. In this decision as in others the power of Goering is evident behind the scene. He disliked Raeder and had sufficient influence with Hitler to hinder the naval effort by withholding air support and reducing allocations of men and steel.

The answers to many of the war time puzzles are furnished in *Hitler and His Admirals*. What was the true story of the *Graf Spee*? Why didn't the Nazis invade England? Why were the three cruisers at Brest slipped through the Channel instead of into the Atlantic? Why didn't the Germans seize Malta and Spain to aid Rommel in North Africa? Some of these questions have been discussed in the press or in other books but this volume is a ready source for many of the answers.

It is helpful to your understanding of the war to have this book at hand should you read General Fuller's study of the second world war. The two books complement each other because General Fuller confines his history of the European-African Theatre to operations over land with brief allusions to naval operations whereas Martienssen reverses the process. Reading the above books and Churchill's latest may give you a suspicion that the sea power of the Allies had a

decided influence on the defeat of the Axis. In any event the war has become cold and this historical piece points emphatically to the need for all the Admirals, Air Marshalls and Generals to understand fully the strategic interdependence of all methods of warfare.

THE WAR OF 1812. By Francis F. Beirne. Maps by Dorothy De Fontaine. New York: E. P. Dutton & Co., 1949. 410 pages. \$5.00.

REVIEWED BY ASSISTANT PROFESSOR
ROBERT W. DALY, U. S. NAVAL
ACADEMY

Mr. Beirne, the "Christopher Billogg" of the Baltimore *Sun*, has written a newspaperman's account of the War of 1812. He entered his task of popularizing this war with a self-admitted humorous approach, but shifted in the midst of his studies to a respectful approach, "to let the story tell itself." Except for his need to derive some rather curious lessons of significance for our day, it is hard to see how he expected to improve upon Mahan's two volume study of the War, or upon the account by Henry Adams as synthesized by the *Infantry Journal*, or even upon the flamboyant work by Theodore Roosevelt written when the future President was only twenty-four years old.

Mahan and Adams and Roosevelt may rest in peace.

Starting with the first page of his text, Mr. Beirne remains an excellent columnist, but does not become a good historian. "The Barbary pirates had given trouble," he declares. "They had, however, been severely dealt with by the infant United States Navy and temporarily subdued. . . . A young nation had stepped in, and won, where the ancient powers of Europe feared to tread." One wonders if Mr. Beirne troubled to glance at Allen's excellent work on the subject, or Captain Knox's extremely useful if not definitive compilation of documents published by the Navy Department.

The author's attitude, then, is basically nationalistic, and the tone of the whole book is seen in the sentences quoted above. He manages to impart color to the *Chesapeake-Shannon* action. The *Chesapeake* "looked for

all the world like a black panther ready to spring on her prey"; the *Shannon*, waiting outside Boston, "darted back and forth like some monstrous bird of the sea." "Broke was a competent officer and he knew his crew. For weeks as the *Shannon* cruised along the coast he had rehearsed his men in their parts until they were perfect." This is colorful, perhaps, but not an accurate picture of the crack Captain and gunnery specialist who had taken years to make the *Shannon* into a smart frigate.

The Battle of Lake Erie is better described and even makes note of the fact that Barclay's best chance lay in keeping the fight at long range in order to utilize his long gun superiority against the powerful 32-pounder carronades which constituted 90% of the armament of the two major American vessels. Having recognized this, Mr. Beirne next has Barclay gallantly closing the range!

In treating the Battle of Lake Champlain, Mr. Beirne complacently looks at the box score and decides that the "forces were fairly evenly matched," completely overlooking, of course, the remarkable place in history held by the frigate *Confiance*, which, comprising about 60% of the British strength, was launched, equipped, fought and captured in 17 days. Much less than having a shakedown, the *Confiance* went to her fate after barely squeezing in one gun drill prior to action. Unfortunately, Mr. Beirne missed a good bet in not exploring the remarkable aftermath of the battle, when, in the court-martial, the Royal Navy officially placed all blame on Sir George Prevost, for having urged Downie precipitately into action.

The maps by Dorothy de Fontaine are clear and well drawn.

For a quick, superficial glance at the War of 1812, the book is adequate. In all other respects, it is disappointing.

THE FORTUNATE ISLANDS. By Walter Karig. New York and Toronto. Rinehart & Company, Inc. 1948. 226 pages, 95 illustrations, 1 map. \$3.75.

REVIEWED BY CAPTAIN E. JOHN LONG,
UNITED STATES NAVAL RESERVE

In the press of news concerning hot and cold wars throughout the world recently,

little attention has been paid to "American" Micronesia, a peaceful empire that stretches over as much of the globe as the United States itself. At the close of World War II these scattered dots on the broad bosom of the Pacific were placed under the trusteeship of the United States, by the United Nations, and the U. S. Navy was assigned the actual job of running them.

So, for administrative purposes, they are part of our American domain, and they propound a brand new job for that service which must, and is, ready to meet any problem—on land, in the air, on the sea, or under the sea.

Captain Karig's assignment from the Chief of Naval Operations, to prepare a report on Micronesia for popular consumption, was a "natural." For years one of his hobbies has been the study of these mystic isles, and of the strange, but really quite logical, customs of the carefree brown natives who inhabit them.

In contrast to the convictions of those who, for over a century and a half, have determined the American system of proselytizing in many lands ("make them like we are"), Karig's advice is to leave the people of Micronesia strictly alone. Some of their exotic customs, and their methods of farming and fishing, may not be ours, but, the author pleads, "Let's leave one corner of the earth uncontaminated by tin-can civilization, so that when we of the white race wipe each other out with atomic bombs and biological warfare, the Micronesians can take over the world without handicap."

This is a "rugged," forceful narrative of a little-known area; one not to be taken lightly. Unlike "Tales of the South Pacific," and "The Naked and the Dead," it is not a war book, but rather a post-war book, dealing intimately with problems we have inherited in our role as senior victor among the Allies.

It lays squarely on the line the grave question as to who should ultimately govern these people as long as the United States government retains trusteeship. In the face of vigorous efforts on the part of the Department of the Interior to take over the administration of these islands, Captain Karig boldly declares that, as long as the islands can never be self-supporting, and, for the

sake of the security of the United States, can never be allowed to stray too far from the apron strings of one of the U. S. armed services, they should be under the administration of the Office of the Secretary of Defense—that is, in the hands of civilians within that branch of the government.

The author points out that the U. S. Navy did not seek, and does not want, the job it has today, although reliable reports from every quarter indicate that the natives were never better cared for, nor were happier, than they have been during the last two years under Navy control.

It is not the intent of this reviewer to suggest that "The Fortunate Islands" is propaganda, or apologia, about the stewardship of the Pacific islands, won at the cost of so much precious American blood during World War II. Karig's semi-official report is really a new kind of travel and history log-book—frank, witty, philosophic, and penetrating. It should be prescribed reading for those professional travel writers and lecturers who can see nothing but "sweetness and light" wherever they go, and who deprecate everything not done our way. This reviewer, however, would be derelict in his duty if he did not prescribe for such innocents, prior to reading "The Fortunate Islands," a strong dose of insulin—for shock! In both pictures and text this volume pulls no punches about "the facts of life."

CHARTER OF THE UNITED NATIONS, COMMENTARY AND DOCUMENTS (Revised edition). By Leland M. Goodrich and Edvard Hambro. World Peace Foundation: Boston, 1949. 709 pages. \$4.75.

WAR AND PEACE AIMS OF THE UNITED NATIONS, 1943-1945. By Louise W. Holborn. World Peace Foundation: Boston, 1948. 1278 pages. \$6.00.

REVIEWED BY ASSISTANT PROFESSOR
R. M. PAONE, U. S. NAVAL
ACADEMY

The authors of these two works treat the same subject, the United Nations, but each in a different manner. Professor Goodrich and Dr. Hambro have revised their 1946

edition of the Charter of the United Nations and have brought it up to date. It is a standard work in the field of United Nations history. Not only does it give an excellent history of the background of the formation of the United Nations Charter, but it also explains the reasons for each of the Articles in the Charter. The authors illustrate quite skillfully how the United Nations Charter has been applied to the very important Spanish, Greek, Indonesian, and Palestine questions.

However, the authors do not clearly explain the solution to the question of whether or not the Constitution of the United States is subordinated to the Charter of the United Nations. In a comparison between the League of Nations Council and the Security Council of the United Nations, the authors state, "the League Council could only recommend to members the military measures they should take in support of the Covenant. The Charter, on the other hand, empowers the Security Council to make a decision, not only regarding diplomatic, economic, and financial measures to be taken against an aggressor, but also regarding military measures as well. Under Article 25, this decision is binding upon Members." Article 25 states, "the Members of the United Nations agree to accept and carry out the decisions of the Security Council in accordance with the present charter."

These articles involve the Constitution of the United States very specifically. They arouse the questions: Do our agreements within the U. N., made at a time when the world was (and still is) war conscious, bind the U. S. Government so that an act of the Security Council will be a declaration of war for the United States? Does the Congress of the United States still have the power of declaring war? The authors say that agreements by the United States in the United Nations bind the U. S., which is true. However, do these agreements bind the U. S. so that Congress loses one of its more important functions—the power of declaring war?

The significance of this important issue involves the practical interpretation of whether the international law made by the U. N. prevails over the Constitutional national law of the United States. If the

superiority of the international law is maintained as a matter of practice, then Constitutional amendments to the United States Constitution are necessary.

Professor Holborn's *War and Peace Aims of the United Nations* is the second in a two-volume series on the policies of the United Nations, the first volume having been published in 1943. This work consists of excerpts from the speeches of the leaders of the member nations of the United Nations. It is designed as a reference work only, the author deciding to omit the splendid explanations of policy given in the work by Goodrich and Hambro. To have edited this second work the author was faced, no doubt, with the many serious difficulties connected with acquiring adequate source material and deciding which documents to use.

The work treats the speeches of the policy makers of the U. N. members in a chronological order, with few exceptions. Thus a reader must thumb through the whole book in order to acquire an understanding of the policies of the "Big Five" with each other or with other nations. A topographical division would have made the book much more interesting and useful as a reference book on the United Nations.

A careful re-reading of many of the excerpts from the speeches show that it would have been more practical for Dr. Holborn to have printed the speeches in full, because no adequate interpretation can be given to the short phrases printed. Hence many of the excerpts are without significance.

Another point which can aid the misgivings of the reader is the section of the book entitled "Preparation for Invasion of Western Europe, Sept. 3, 1943 to June 6, 1944." In this section the author has placed speeches by Lord Halifax on future aid to Canada, by Lord Wavell on the Government in India, by Winston Churchill on Yugoslavia, by Anthony Eden on Spain and Portugal, as well as speeches by Lord Cranborne on the subject of minority peoples. The author seems to have decided not to show any connection between the speeches printed and the section title under which these speeches were placed.

Certainly the volume illustrates clearly the vast amount of source material over

which the author has had to pass judgement. Although she has made a strong attempt to aid the student of international affairs, the work lacks the coordination and symmetry in thought which is so essential in an adequate historical work.

THE RED FLEET IN THE SECOND WORLD WAR. By Admiral of the Fleet I. S. Isakov, translated by Jack Hural. London: Hutchinson & Co., Ltd. 124 pages. 10s 6d.

REVIEWED BY LIEUTENANT COMMANDER
H. F. ROMMEL, U. S. NAVY

Written in party-line style by a Russian, apparently for Russians, this book contains a summary of the tasks and accomplishments of the Russian Navy in the Great Patriotic War. After a discussion of the general situation confronting the Red Fleet—its main and most important task was the protection of the strategic flanks of the Red Army—the author describes in a general way operations in the Baltic, in the Northern theater, and in the Black Sea.

It is claimed that "in all their actions, the men of the Soviet fleet and air forces have never even sighted the silhouette of a German cruiser, to say nothing of a battleship," and this is intended to support the assertion that Germany would not risk her heavy ships in Soviet waters. It is also testimony to the lack of experience of the Russian Navy in surface actions.

No date of publication is indicated, but the book apparently was written before the Russians started ignoring the contributions of the other allies, as the importance of lend-lease is acknowledged, one of the objectives of the Germans being stated to be "to isolate the U.S.S.R. from the rest of the world and thereby prevent shipment of armaments and food from the United States and Great Britain," and one of the tasks of the Soviet Northern Fleet is given as that of "defending our sea routes to England and the United States within the radius of its operational zone."

There is brief mention of amphibious operations by the Russians in the Black Sea, which were "inevitably successful," although

carried out mostly in stormy weather without special landing craft, and against opposition. The skill of the Russians at mine warfare and with motor boats is also emphasized. One interesting item is a reference to *joint operations* of Russian torpedo bombers and submarines in the Baltic; there are no details.

The importance of large numbers of auxiliary vessels is stressed, and the men of the auxiliary and merchant fleets are praised. The whole tone of the book is one of glorifying the Russian armed forces. No mistakes or failures are admitted.

While this may reduce the usefulness of the book as a history, this little book, in the absence of more detailed and documented accounts of operations of the Russian Navy, provides an instructive insight into contemporary naval thinking in Russia.

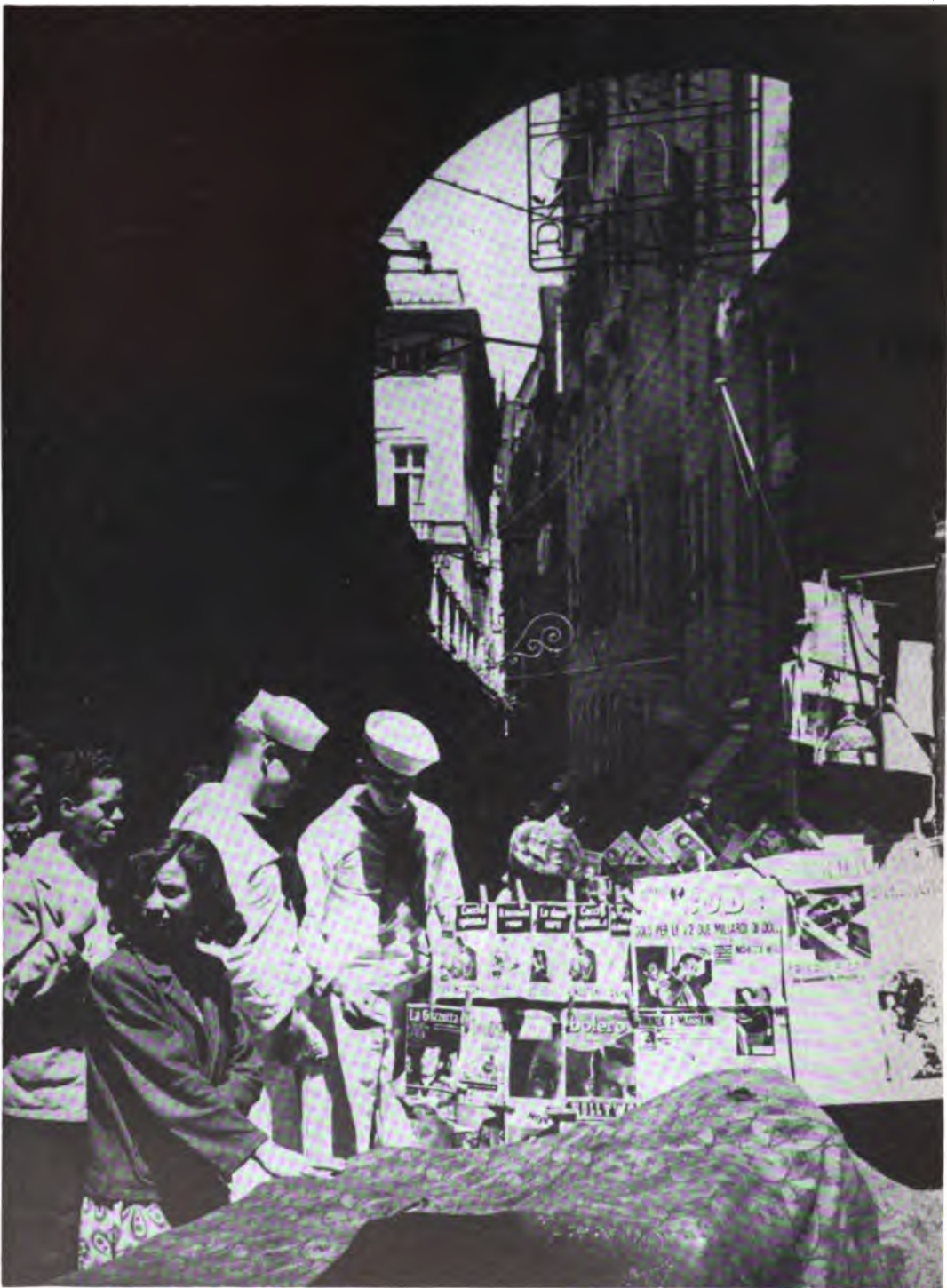
Thumbnail Reviews

Sport Fishing Boats. By S. Kip Farrington, Jr. New York: W. W. Norton & Company, 1949. 154 pages. \$4.00.

Excellent illustrated with over sixty pages of photographs, this book covers its slight subject thoroughly from the point of view of the expert big-fish angler. Since Mr. Farrington is one of America's most famous sport fishermen, that fact is to be expected. On the other hand, the book makes no real contribution to the designing, building, powering, or equipping of such boats beyond the likely knowledge of anyone who is seriously interested in the subject.

The Book of the Ship. By A. C. Hardy. New York: The Macmillan Company, 1949. 322 pages. \$8.00.

The sub-title, "An Exhaustive Pictorial and Factual Survey of World Ships, Shipping, and Shipbuilding," rather over-describes this volume. Actually it is a popular account of the world's commercial vessels, with emphasis on British ships and shipping problems. The chapter on fishing ships, for example, covers most British types and the more important European seiners and trawlers, but the West Coast tuna clipper is the only American fisherman mentioned. Well illustrated and organized, the book would be improved by inclusion of a good index. It is, nonetheless, a handsome and welcome publication.



Official U. S. Navy Photograph

AMBASSADORS OF GOOD WILL

U. S. bluejackets visit St. Peters in Rome. U. S. Navy ships and personnel are familiar and welcome sights in cities from Constantinople to Bergen.



THROUGH JULY 21, 1949

UNITED STATES.....	1068
Mediterranean Fleet—Fleet Visits—U. S.-British Exercise in Japan —Kurile Islands—New U. S. Air Command in Germany	
GREAT BRITAIN.....	1071
Carrier Strength—All BB's Inactive—China Station—Sub Exercise—USSR Returns Ships—Canada Builds Escorts	
FRANCE.....	1075
Delay Work on BB and CV	
USSR.....	1075
Air Show—Budget Analysis	
OTHER COUNTRIES.....	1077
India	
AVIATION.....	1077
PO-1W Constellation—F-84E—Air Maneuvers over England— Bombers for Greece	
MERCHANT MARINE.....	1080
Strength Up—Ships Watched in Port—War Risk Pay in China	
SCIENCE.....	1082
Ship Stabilizer—Camera-Projector for Radar	
INTERNATIONAL.....	1083
Western Union Naval Exercises	
MISCELLANEOUS.....	1084
Questions A-Bomb Blitz—State Department Couriers	

UNITED STATES

Mediterranean Fleet

Chicago *Tribune*, July 15.—Vice Admiral Forrest P. Sherman and his sixth task fleet have become an unofficial “floating embassy” of the United States to the Mediterranean peoples.

When the fleet with its aircraft carrier, cruisers, destroyers and supporting ships, is not engaged in tactical exercises it moves along the shores of the Mediterranean carrying messages of good will to more than a score of ancient ports.

Mediterranean townsfolk who in the past saw only American tourists or merchant seamen are now meeting young American sailors who come ashore on liberty. The sailors with American dollars in their pockets spend more than 2 million a year in these ports. Local officials, churchmen and other dignitaries exchange greetings with fleet bigwigs, come aboard the ships for lunch or dinner and roam around the vessels for a first-hand view of American naval power.

BANQUETS FOR OFFICERS

Admiral Sherman, his staff and high ranking officers from other warships in the fleet go ashore to make formal friendship calls upon the local officialdom. Compliments are exchanged and the local dignitaries often entertain in their turn with dinner or even elaborate banquets. Enlisted men are entertained in the homes by local families.

To touch as many ports as possible, Admiral Sherman scatters his fleet of 14 to 20 warships among five or six anchorages and the two rear admirals, one in charge of cruisers and the other in charge of the carrier force, help him carry out his “diplomatic” mission.

Among the cities which the fleet has visited are Malta, Gibraltar, Sfax, Tunis, Algiers, Phaleron bay (Athens), Villefranche, Cannes, Tripoli, Taranto, Toulon, Genoa, Argostoli, Salonika, Istanbul, Naples, Sicily, Golfe Juan, Trieste, Venice, and Oran.

Often the shore visits are brief and are held with local port officers, the mayor and the naval commander in the area, but sometimes Admiral Sherman has social chores that would even tire the striped pants set. In Italy he went to an elaborate luncheon of 15

courses which lasted through the afternoon. In Athens, for contrast, he attended three church services, Greek Orthodox, Roman Catholic and Episcopal in a single morning.

More than 45,000 seamen and marines visit the Mediterranean each year, with a new group arriving each four months on a rotation basis. Included are about 1,200 marines also rotated each four months when a new force of ships replaces the ships on station. Only Admiral Sherman's staff of 20 officers and 100 enlisted men remain here permanently.

Marines at Crete

New York *Times*, July 17.—United States Marines hit the beach on the island of Crete today in a mock landing assault to keep in trim for the real thing.

About 1,200 leathernecks of the Eighth Marine Battalion swarmed ashore in four waves at Kalivia Bay at the mouth of Suda Bay on Crete's northwest shoreline.

It was the most eastern point in the Mediterranean at which the Marines ever had made an amphibious attack, either mock or real. The Marines first fought in the Mediterranean at Tripoli in the war against the Barbary pirates, 1801–1805.

Today's landing highlighted current maneuvers of the Sixth Task Fleet commanded by Vice Admiral Forrest P. Sherman. After a four-day stay at Crete, the fleet will continue to Athens and then Istanbul.

Fleet Visits

London *Times*, June 18.—Portsmouth, England.—The United States Navy Task Force 61, a midshipmen training squadron, consisting of the 45,000-ton battleship *Missouri*, Flagship of Rear-Admiral A. E. Smith, its commander, five destroyers, and four fast light minelayers, arrived here today for a week's stay.

The *Missouri*, on board which the Japanese surrender was signed in Tokyo Bay on September 2, 1945, anchored at Spithead in the early morning. After a 21-gun salute to the British flag had been fired, and returned by an Army battery ashore, Rear-Admiral Smith, accompanied by his Flag Secretary, Commander H. A. Lamar, U.S.N., flew in a helicopter to Southsea Common and landed

the city council chambers, where he met the Lord Mayor, Alderman John H. Bennett. It was the first time in the history of the city that a civic call of this kind had been made by air. Later he called on the Commander-in-Chief, Admiral of the Fleet Sir John Jellicoe, and the Mayor of Gosport, C. B. Osborn. The Commander-in-Chief received the call in the *Missouri*.

Meanwhile the other ships of the squadron—the destroyers U.S.S. *New*, *Holder*, *Rich*, *Truxtun*, *L. Wilson*, and *Damato*, and the minesweepers U.S.S. *Shannon*, *Thomas E. Fraser*, *Yankee*, *F. Bauer*, and *Shea* had entered the harbor.

The ships' companies number 4,000 officers and crewmen, besides 800 midshipmen from the Naval Academy at Annapolis, and 400 Reserve midshipmen from 12 American universities, who are receiving sea training during the squadron's eight weeks' cruise. Sight-seeing trips and a comprehensive program of entertainments have been arranged for the stay.

During the squadron's stay here the harbor will be open daily to visitors. Tomorrow evening the *Missouri* entered the harbor and was made fast alongside the South Broadway jetty.

New York Times, June 18.—Scandinavia. Three warships of the United States Navy will visit the capital cities of Norway and Denmark from July 22 to 27, it was announced today.

Admiral Richard L. Connolly, Commander in Chief of the Naval Forces in the Western Atlantic and Mediterranean, will lead the cruise to Oslo and Copenhagen on the heavy cruiser *Columbus*. He will be accompanied by the destroyers *S. B. Roberts* and *O'Hare*.

New York Times, July 7.—Port Hueneme, Calif.—Three vessels comprising the vanguard of the Navy's sixth annual resupply expedition for United States military and naval outposts in northern Alaska sailed here last night.

The expedition will carry 45,000 tons of supplies and equipment, chiefly machinery and oil for the Army, Navy, Air Force and Coast and Geodetic Survey, Bureau of Indian Affairs, Weather Bureau stations in the vicinities of Point Barrow, Nome and Barter Island. The fleet, composed of eleven ships led by

the transport *George Clymer* and involving 2,900 personnel, will include a tanker, four LST landing ships, and the ice breaker *Burton Island*. The other vessels are loading at ports between here and Seattle, and the sailings are scheduled to be completed by July 26.

Two underwater demolition teams, totaling 170 men, are being taken along to facilitate unloading. Some of the destination districts are ice bound for all but a few weeks of the year.

New York Times, July 9.—Seoul, Korea.—The United States light cruiser *Manchester*, accompanied by the destroyers *Henderson* and *Rowan*, arrived today for a three-day good-will visit to the Korean Republic.

From Inchon, port town twenty-five miles east of here, 470 sailors and officers traveled by special train to the capital for a sightseeing tour. Visiting parties of the remainder of the three ships' crews will visit here Saturday and Sunday.

Rear Admiral T. H. Binford, commander of Cruiser Division Number One, and Commander R. H. Taylor, chief of Destroyer Division Fifty-One, headed the visiting Navy party.

The officers will lunch tomorrow with United States Ambassador John J. Muccio and will be guests of President and Mrs. Syngman Rhee at tea. The Minister of National Defense, Sihng Sung Mo, will be host at dinner tomorrow night. The three ships will leave Inchon Sunday and will make an overnight call at the southern port of Pusan.

United States-British Exercise in Japan

New York Times, July 15.—Tokyo.—Joint exercises looking to the defense of Japan are now being carried on by units of the British Pacific Fleet with the United States Fifth Air Force stationed here, General Douglas MacArthur's headquarters announced today.

The training maneuver, it was stated, is intended to prove the ability of the ships and planes based on Japan to "detect and destroy an enemy force of aircraft and surface vessels" before its arrival off the coast in the Tokyo Bay area.

Employees of the Japanese Nichiro Fisheries company are being retained as technicians.

Bad weather, a lack of resources, and supply problems have reportedly hindered the Russians in developing the Kuriles, although they seized mountains of military supplies, including trucks, gasoline, food, clothing, and armament.

Militarily the chain is a threat to the Aleutians, Alaska, and Japan. The submarine base on Etorofu is another potential menace. Soviet aircraft and new fortifications have been reported by returning Japanese and an undisclosed number of troops garrison the old Japanese installations.

New U. S. Air Command Created in Germany

New York Times, July 9.—Frankfort, Germany.—United States fighter plane forces in Germany were put under a single, battle-ready command today as a major United States contribution to the defense of Western Europe under the North Atlantic Treaty.

Brigadier General Thomas C. Darcy, regarded as one of the leading tactical experts of the Air Force, was put in command of what will be called the Second Air Division.

General Darcy will command the 150 fighter planes of the crack Eighty-sixth Fighter Group, the jet-propelled Thirty-sixth Fighter Group and a force of B-26 reconnaissance bombers.

He will take charge of the radar warning nets in Germany and will be assured of adequate reconnaissance planes and the supporting units necessary to keep his fighters in the air.

The new command will have all the elements of the famous "minute men" of the British Royal Air Force Fighter Command that was established near London in the fateful battle of Britain in 1940.

General Darcy will make his headquarters at Lärdsberg, near the two principal American fighter bases in Germany.

Lieutenant General John K. Cannon, United States Air Commander in Europe, made the announcement of the formation of the new command.

Air Force experts consider the new step the most significant that the United States

has taken in Europe since the squadrons that smashed Germany were dismantled after the war.

GREAT BRITAIN

Review of Carrier Strength

Aviation Week, June 20.—London.—While the United States has scrapped its aircraft carrier building program, Britain is proceeding with a slow but steady development of its carrier-based naval aviation.

British naval aviation still has a long way to go to catch up with U. S. carriers now in service. Largest of the British carriers are the *Eagle* and *Ark Royal* in the 37,000-ton class. These compare with the three U. S. carriers of the 45,000-ton *Midway* class and the 65,000 tons of the abandoned super-carrier prototype.

Eagle Launched—*Eagle* was recently launched and will be commissioned before the end of the year. *Ark Royal* is still building at Birkenhead and is not expected in service before 1952. This class of British carrier is 803 ft. long with a maximum beam of 112 ft. Main anti-aircraft armament is 16 4.5-inch guns in addition to 61 others of smaller caliber.

Speed is expected to be better than the 32 knots of the fleet carriers now in service.

U. S. *Midway*-class carriers have a top speed of 35 knots, are 986 ft. long and carry a complement of 100 airplanes.

Size of latest British carrier plane groups will not be determined until after they go into service but it will probably not be more than 80 planes apiece.

Modify Carrier—Of the seven 23,000-ton British carriers only one, the *Implacable*, is now in service. Two others are used for training; two in reserve and two, the *Formidable* and *Indefatigable* are undergoing modification to handle the latest types of jet aircraft.

This type of carrier compares with the U. S. 27,000-ton *Essex* class of which the U. S. Navy now operates eight with a reduction to five scheduled after July 1, 1949.

Essex class carriers handle 80 plane groups and have a speed matching the 32 knots of the British medium aircraft carriers.

The British now have four light carriers (25 knots) in fleet service with two more on special experimental anti-submarine warfare duty. Eight of this class were under construc-

tion but work on three has been suspended indefinitely. These are roughly comparable to the U. S. "Jeep" or escort carriers.

Speed Critical—There has been some criticism that current British carrier types are not fast enough to launch and land the latest jet fighters that are now coming into service. British official sources claim that even the light carriers are adequate for jet aircraft. U. S. experience has been that its latest operational jet fighters, the Banshee (F2H) and Panther (F9F) can land on a carrier deck but that they require catapults for take-off.

There has been considerable experimental work done in Britain on new types of carrier-based planes but only one jet fighter, a naval version of the Vickers-Armstrong Supermarine Attacker has been ordered in quantity for carrier use. An experimental quantity of de Havilland Sea Vampires, a naval version of the standard RAF fighter, have been flown off carriers.

Rubber Deck—These Sea Vampires have been used in experimental carrier operations without conventional landing gear. A rubber landing mat is laid on the flight deck. When the Sea Vampire engages its tail hook it flops down hard on the rubber mat. Belly structure of the plane has to be reinforced for this type of landing but so far no structural failures have been encountered. Some increase in aircraft performance results since carrier-based planes require extremely heavy landing gear to take the shock of arrested landing on the carrier deck.

Carrier Doctrine—The new Hawker N7 46 jet fighter was originally designed for the British Navy but has not been ordered into production. A swept-wing version of the Hawker fighter is now flying.

British carrier doctrine is still to operate as fleet support. So far there has been no evidence of the development of a British naval policy of using carrier task forces as an element of strategic bombardment, similar to the U. S. Navy doctrine that has been the source of so much controversy between the U. S. Air Force and Navy.

Battleships Withdrawn From Service

Christian Science Monitor, July 15.—London.—What may prove to be an historic

decision has just been taken by the British Admiralty here.

It is to withdraw all battleships from active service with various fleets of the Royal Navy.

With its big ships put in reserve, the navy will concentrate on small craft—mostly destroyers, antisubmarine ships, minelayers, minesweepers, torpedo boats—and on naval aircraft.

This decision follows swiftly on a series of combined fleet maneuvers by navies of the Western Union powers. British and French big ships took part in these exercises alongside smaller ships and aircraft.

VALUE DECLINES

The maneuvers are said to have rammed home again the point that the value of battleships becomes more and more limited as time and the airplane progress.

No new battleships are being built in Britain. None are even planned.

Heavy aircraft carriers also are beginning to be viewed as a luxury, in home waters at least. More than ever, Britain itself is looked upon as an anchored aircraft carrier which has the advantage that it can't be sunk.

But that the Royal Navy still sees possible special value for the big ships in the future is evidenced in the fact that five of Britain's latest biggest battlers, although in reserve, are to be kept "at short notice."

"It will be clearly understood," an admiralty communiqué remarks, "that all of our capital ships, whether in reserve or otherwise, will be available for operational duty if the occasion demands."

SUBMARINES CALLED A THREAT

The admiralty declared it feels justified in taking its big ships out of service because "very few large surface ships are being kept operational anywhere in the world."

It is considered highly unlikely that in the event of another war, large surface vessels ever would again meet each other in battle.

Submarines, however, now able to remain under water for long periods and to maintain high under-water speeds, remain a very serious menace for an island nation like Britain.

The manpower saved on one battleship



International News Photo

BRITISH BATTLESHIPS JOIN THE INACTIVE FLEET

The *King George V*, along with Britain's newest, the 50,000-ton *Vanguard*, are to comprise part of a training squadron.

can keep three whole flotillas of antisubmarine ships at sea.

TRAINING FUNCTION

Britain's newest battleship, the 50,000-ton HMS *Vanguard*, is to be handed over to a "training squadron." There it will join the battleship *King George V* and the heavy aircraft carrier *Victorious* for use as a seagoing training ground for thousands of new navy men.

The battleships *Duke of York*, *Howe* and *Anson* are to be reduced to reserve, with the *Duke of York* becoming the flagship of the flag officer commanding the reserve fleet.

Although the big ships remain prepared for quick recommission "in the event of an emergency," navy men feel this decision of the Admiralty may mark the end of the battleship's long service as an essential part of the Royal Navy.

China Station

New York Times, June 17.—Shanghai.—A week after the reported mining of the Yangtze River mouth, one British and one

United States river pilot set forth today to sweep the channel and again open to shipping the world's largest city under the Communist flag.

They rode two makeship minesweepers, one of which had been lent the British Consul General and was commanded by a chief petty officer of the Royal Navy. The entire operation is being undertaken in close cooperation with the Shanghai Military Control Committee and, until tonight it was an elaborately guarded secret. Prior to departure, the Blue Ensign of Great Britain on the consular vessel was hauled down for the duration of the mission and the Red flag was hoisted in its place.

This not only emphasized that the British Government was not participating officially but also insured that the Communist shore batteries would hold their fire. One of the reasons for the delay in giving the volunteer sweepers the "green light" was the necessity to warn all Communist units along the fifty mile Yangtze river shore that the two sweeping vessels and an accompanying pilot boat were on the way.

For the past few days delicate negotiations have been going on concerning ways and means of exorcising the reports of mines in the vital river channel. This channel controls access of ocean vessels not only to Shanghai, but also to the great artery of the Yangtze, which is navigable for 1,600 miles into the heart of Asia. The river's importance to China is difficult to appreciate for residents of continents where rivers are no longer the primary routes of transportation.

Virtually all the Communist experience has been in ground warfare. There were plenty of Britons and Americans around town who had swept mines, including Yangtze pilots who had swept them after the war from the very channel allegedly mined a week ago today. Many of these men—pilots, shippers and businessmen—were eager to get the harbor open so that they would be back in business.

However, this raised the touchy question of foreign interference in quasi-military affairs.

About 10 o'clock this morning the "task force" set forth with the British ship carrying Captain William Sudbury of Liverpool, England, and the sister ship carrying Captain Columbus D. Smith, whose home is reported to be in Atlanta, Ga. Both are pilots. The third ship in the group was a regular pilot vessel which was to lie off and relay reports by radio.

The pilots are working on the assumption that no mines are there.

New York *Times*, June 18.—Shanghai.—This great port was declared open to shipping of the world this morning after two river pilots—one from Atlanta, Ga., and one from Liverpool, England—dragged a 1,000-yard cable over the approached channel and proved it free of mines.

New York *Times*, July 11.—Hong Kong.—A warship of China's "blockade" fleet today intercepted a British-owned freighter in Chinese coastal waters, and the Royal Navy immediately alerted a destroyer to rescue the cargo ship.

However, the freighter was allowed to proceed after six hours, and the British warship's emergency sailing orders were cancelled.

The freighter, identified as the 2,800-ton

coastal vessel *Yochow*, was intercepted by a Nationalist gunboat off Communist-held North China. The *Yochow* is owned by the China Navigation Company, a subsidiary of the British shipping firm of Butterfield & Swire.

Crewmen of the British destroyer *Concord* were recalled to their ship after word of the *Yochow's* detention reached here, and ordered to prepare to sail immediately for North China.

Before the warship could sail, word that the *Yochow* had been released reached here and the destroyer was ordered to remain in port.

Submarine Exercises

London *Times*, June 8.—H.M.S. *Maidstone*, the submarine depot ship, is taking part in the biggest summer exercises for home-based submarines of the Royal Navy since the war. The Flag Officer Submarines, Rear-Admiral G. B. Grantham, flying his flag in the *Maidstone*, will direct operations at sea until June 12, and for the remainder of the exercise period ashore from Londonderry.

The exercises, extending over a period of 18 days, will be carried out in the North Western approaches. In a preliminary phase vessels will operate independently and carry out maneuvers and standard anti-submarine practices. On Friday the exercises will assume the form of continuous patrols under simulated war-time conditions.

Vessels of three submarine flotillas, including several of the latest "A" Class submarines, are to take part, and surface forces will include another depot ship, the *Montclare*, two submarine target ships, about 20 destroyers and escort vessels, and from June 13 to 17 the aircraft-carrier *Theseus* bearing the flag of Rear-Admiral M. J. Mansergh.

USSR Returns Warships

London *Times*, June 16.—It is announced that two more of the British warships lent to the Russian Navy in 1943 are to be returned to this country, arriving in the Firth of Forth next Tuesday. They are the *Derski*, formerly H.M.S. *Chelsea*, and the *Zhivuchi*, formerly H.M.S. *Richmond*. The handing-over formalities will take about four days, during which normal facilities for shore leave and

recreation will be offered to officers and men. They will return home in the Russian troopship *Byell-Ostrov*.

Nine destroyers in all were lent to Russia in 1943. One, the *Zhostki*, formerly H.M.S. *Roxborough*, was returned at the same time as H.M.S. *Royal Sovereign* last February; one, H.M.S. *Churchill*, was lost during the war, and another, H.M.S. *Lincoln*, was stated to have been expended to provide spare parts for the survivors, but that has not been officially confirmed.

Canada to Build Escorts

London *Times*, June 23.—Mr. Claxton, the Minister of National Defense, has announced that Canadian Vickers Limited, of Montreal, is starting work immediately on the preparation of working drawings for the construction for the Royal Canadian Navy of three anti-submarine escort vessels of a high-speed type not yet in production elsewhere.

When the drawings are ready the construction contracts will be awarded to three different shipbuilding yards under an arrangement between the Navy and the shipbuilding industry, which will result in the production for the first time in this country of a practicable warship of Canadian design and manufacture.

The vessels are being built primarily for detection and the destruction of modern fast submarines, and in evolving their design much assistance has been received from the Royal Navy and from the United States Navy. In function the vessels will supersede the frigates and corvettes of the last war.

FRANCE

Delay Work on Carrier, Battleship

New York *Herald Tribune*, June 22.—Paris.—The National Assembly voted 408 to 181 today to delay completion of the battleship *Jean Bart* and the aircraft carrier *Clemenceau* in favor of building three escort ships, two submarines and a gunboat for the Rhine.

Paul Ramadier, Minister of National Defense, convinced critics that the government would be wise to economize on the heavy units because their only rivals were the American and British fleets. He also pointed

out that submarines had grown in importance since World War II, with all the great powers stressing development of undersea craft, and, despite the necessity of defense economies, France had to follow suit.

On the *Jean Bart* alone, which needs only anti-aircraft armament and radar equipment to be completed, it would be possible to save 2,000,000,000 francs (about \$6,500,000), Mr. Ramadier said.

Mr. Ramadier gave two other reasons for concentrating on the lighter ships at this time. "Our first task is to defend our frontier on the east," he said. "This defense involves the participation of small river craft." The second reason, he said, was "to assure our communications with Africa," which "requires a light fleet."

U.S.S.R.

Air Show Stresses Jets

New York *Times*, July 18.—The new Soviet jet planes described by the press as looking as if they had come "from the arsenal of interplanetary flight" were demonstrated for the first time publicly today in the Soviet Aviation Day show at Tushino airdrome, just outside Moscow, before Marshal Joseph Stalin and half a million spectators.

The new jets were shown by the Soviet Air Force in an elaborate spectacle that included hundreds of aircraft of all types as well as several hundred parachutists and a mock combat between a squadron of bombers and jet fighters.

One of the new Soviet jet models flew over the airfield at the conclusion of the show at an extremely low level. This was followed by single flights of extremely speedy jet fighters, also flying at a very low altitude.

Foreign military attachés, who watched the flight of the new jets, said they seemed to incorporate advanced engineering principles and to indicate progress over the jets displayed in the May Day celebration.

The air show provided the biggest jet exhibition that the Soviet Air Force has yet presented.

NEW GLIDER UNVEILED

Another innovation revealed at the show was a new tailless glider, greatly resembling a huge triangular kite. The glider was re-

leased high over the airfield by a towplane and went through extensive evolutions before landing. It drifted exceptionally fast in the brisk wind and turned over and over in something resembling a barrel roll.

The jet planes engaged in extensive aerobatics and formation flying in groups of three to nine planes. The press said no other jet pilots in the world were capable of such group maneuvers, which were carried out in a sunny sky across which there drifted huge white clouds into which the jets repeatedly disappeared.

Premier Stalin appeared in good health and spirits, striding briskly up the stairs to the reviewing balcony overlooking the field. He was accompanied by a number of high officials including George M. Malenkov, Klementy E. Voroshilov, Anastas I. Mikoyan, Nikolai M. Shvernik and Panteleimon K. Ponomarenko. The Vice Marshal of the air show was Lieutenant General Vassily Stalin, the Premier's son.

The press commented on the air show with editorials praising the Soviet air might and warning that the Soviet air fleet stands guard against the "criminal plans of the aggressive drive against the Soviet Union."

Pravda said that "the Soviet people are confident of their strength and know there is a tremendous distance between the plans of warmongers and the starting of a new war; that the peace champions are strong enough to curb aggressors and put a strait-jacket on those who are trying to plunge mankind into the bloody abyss of war."

The press contended that of 80,000 planes built by the Germans in the last three years of the war, 75,000 were destroyed by the Russians. Aviation Marshal Konstantin A. Vershinin, commander of the Soviet Air Force, said in *Pravda* that of all the European capitals against which the Nazi Air Force operated, it was defeated seriously only at Moscow. He said the British and American bombing of Germany was directed mostly at industrial objectives not liked by big American capitalists or those industrial centers that the Soviet Army was about to enter.

Marshal Vershinin said the outcome of the air war against Germany was decided by the Soviet Union and called British statements

that German air strength had been broken in the Battle of Britain "clumsy." He said that "England was saved not by the strategy and policy of Churchill but by the Soviet Union."

Rear Admiral Leslie C. Stevens, United States Embassy Naval and Naval Air Attaché, called the air show "very interesting."

"Especially noteworthy," he added, "was the fact it was restricted completely to modern aircraft. There were absolutely no obsolescent types."

"As usual, the formation and acrobatic flying was magnificent. Such performance comes only after great practice."

Admiral Stevens has seen two previous air shows in Moscow.

Analysis of Annual Budget

Revue de Défense Nationale, May 1949.—The Supreme Council of the Soviet Union approved by the law of March 14 the general 1949 budget. The projected budget entails the following:

Receipts: 446,043 billion rubles;

Expenditures: 415,355 billion rubles.

This means an excess of receipts over expenditures of 30 billion 688 million rubles.

An examination of the comparative table given below suggests a number of remarks.

	1945	1946	1947	1948	Law of 1949
National Defense	128.2	72.2	66.4	66.3	79.1
National Economy	74.3	102.2	132.7	147.5	152.5
Social Culture	62.7	83.2	106.5	105.6	119.2
Administration	9.2	11.7	13.0	13.1	13.7
Servicing the Debt	5.2	6.5	6.5	3.5	
Total			325.1	336.0	364.5
Total Expenditures			361.2	368.8	415.4
Unknown Expenditures			36.1	32.8	50.9

In the first place, the credits allocated to national defense by the new budgetary law have increased in absolute value as compared to those of the two preceding periods. They are slightly more than those of the 1946 budgetary period.

In the second place, a comparative examination of the total of expenses projected with that of the different departments as

communicated officially enables us to note an increasing proportion of unknown expenses. In what measure are the latter applied to National Defense?

Finally, if the budget proper to the armed forces represents but 19% of the total, there is reason to suppose, following the declarations of the Minister of Finance, that these credits cover only the material needs of the armed forces, pay, subsistence, and maintenance; the new material construction remains a duty of the technical ministries about which no indication is given.

OTHER COUNTRIES

India

Manchester *Guardian*, June 8.—Bombay. —Speaking at the naval establishment H.M.I.S. *Shivaji* at Poona yesterday, Vice-Admiral W. E. Parry, Commander-in-Chief of the Royal Indian Navy, said he hoped that within ten years India would have a small task force of the type known as a hunter and killer group.

Recently, he said, India had taken over from Britain H.M.I.S. *Delhi* (former H.M.S. *Achilles*) and three destroyers, and it would be impossible to acquire any more ships until men to man them had been trained. He hoped that India might acquire another cruiser within three years and later more destroyers.

Vice-Admiral Parry also referred to the handicap which India suffered as a result of the loss, after partition, of the permanent naval training establishments at Karachi. This deficiency was being overcome by training facilities at Cochin.

AVIATION

Navy Modifies Constellation For Radar Picket

Aviation Week, June 27.—Bulging with radomes and bristling with antenna spines, the Lockheed Constellation has joined the Navy's rapidly growing stable of radar picket planes. The specially-modified Constellation is called the PO-1W (P for patrol, O for Lockheed and W for warning).

First PO-1W of an experimental order for two made its initial test flight at Burbank, Calif., last week. Second is expected to be

flying shortly after stability problems caused by the bulging radomes are thoroughly explored.

New Requirement—The PO-1W is designed to fill a new Navy requirement for a combination long range radar picket plane and airborne combat communications center. As such the PO-1W can be used for four principle functions:

Radar Picket Plane—The picket plane is far superior to the destroyer radar picket ships now in use since it can carry the search radar to an altitude where the line of sight difficulties that limit coverage from surface radar sets are eliminated. The Constellation can provide 360-degree coverage using radar antennae on top of the fuselage, slung under the belly and installed in especially elongated nose and the tail. The range of the Constellation can be added to radar range to provide extremely early warning of either air attack or submarine activity.

With the increasing speed of jet fighters and attack planes, the Navy faces an urgent need for extending its radar range beyond the 100 miles of ship-borne radar.

Anti-Submarine Patrol Plane—The belly radar of the PO-1W is a special type developed by the Navy for use against the "schnorkel" type submarine which exposes only a small breathing device on the surface. Again the range of the Constellation is important since it can cover large areas on search missions and can carry more powerful radar than can be crammed into a smaller plane.

Radar Ferret—The PO-1W will be equipped with radar detection equipment and counter-radar equipment to jam enemy radar stations. Role of ferret planes in locating enemy radar installations and computing their operational frequencies preparatory to jamming them was an item of increasing importance in the closing months of the last war and is likely to be an even more important function in future air war.

Combat Communications Center—Use of VHF radio requires an airborne relay station to maintain ground to air communications over long distances. The PO-1W can function in that capacity. It can also, by virtue of information obtained from its search radar, function as a combat control center

for fighter control against enemy air attack or against submarine activity.

The Navy has three other models of radar picket and search planes—the Grumman TBM modified with a triple tail fin to stabilize the “guppy” belly radome; the Grumman AF-1S a later development of the TBM series; and the Douglas AD-3W which also has a triple tail to counteract the belly radome. However these three planes are powered by a single engine and have a relatively limited range. They are designed for operation from a carrier on search missions aimed primarily at enemy submarines and surface ships.

Changed Plans—In contrast the PO-1W is land-based, has far greater range and is capable of carrying much more powerful radar and communications equipment. Navy originally planned to use the two Lockheed Constellations for this type of work but later opened the project to competition that narrowed to the Constellation and the Douglas DC-6.

Navy preferred to buy off the shelf commercial transports for experimentation in this field to save money. Lockheed won the competition primarily because of a much lower price.

The two Lockheed PO-1W's are strictly experimental. Since the Navy is venturing into a broad new field, it is likely that any future requirement for a tactical production line aircraft of this type will be relatively slow in crystallizing.

F-84E

Aviation Week, July 4.—Republic F-84E, latest development of the Thunderjet fighter, features performance and maintenance improvements over previous models. Powered by the new Allison J-35-A-17 engine, which develops 5000 lb. static thrust, the new model is faster, has an 850-mile radius-of-action and a service ceiling above 45,000 ft.

Armament includes six .50 cal. machine guns, eight 5-in. HVAR rockets, two 1000-lb. bombs, two 500-lb. fragmentation clusters, depth charges, incendiary bombs and napalm tanks carried in retractable or jettisonable rocket and bomb holders. Maintenance improvements include 180 access doors, re-

tractable battery lift, hinged gun deck, guide rails, snap-on electrical leads and throttle disconnects for rapid engine interchangeability.

The new F-84E has received a structural “beef-up” to increase its allowable “G” loads. The fuselage has been lengthened 15 in. to provide greater room for the pilot. Cabin pressurization and air conditioning equipment is improved. Tip tanks carry fins to permit full airplane maneuverability with tanks installed.

Initial deliveries of the F-84E will go to the 23rd Fighter Group, Howard Air Force Base, Canal Zone.

Air Maneuvers Over England

New York Times, June 26.—London.—The Western European Union went into action today to defend Britain in the biggest air maneuvers since the war. For the first time in peace foreign air forces joined in “battles” designated to yield lessons in offensive and defensive tactics based on greatly improved speeds of modern jet planes.

All the Superfortresses of the United States Third Air Division now based in Britain will make daylight raids in the nine days' exercises, and pilots flying Shooting Stars, the latest American jet fighters, are operating alongside Royal Air Force fighters in Vampire and Meteor jet fighters. France, Belgium and the Netherlands have sent operation room personnel and a Netherlands squadron of British-made Meteors is operating with the defending forces.

The attacking forces, under Air Marshal Sir Aubry Ellwood, chief of the British Bomber Command, and Maj. Gen. Leon Johnson, commander of the United States Third Air Division, opened cautiously with tentative probes of the East Coast defenses.

Arrayed against them was a network of defending forces made up of ground observers, anti-aircraft guns, a radar screen and fighter patrols controlled by Air Marshal Sir Basil Embry, chief of the Fighter Command. More than 500 aircraft are taking part in the exercises which are taking place under Sir Basil's general direction.

Reports on Air Maneuvers

By BENJAMIN WELLES

New York *Times*, July 3.—London.—As Britain's sham air war reached its climax today, top ranking Royal Air Force chiefs were reported satisfied that they were well on the way toward solving any future threat from enemy high-altitude jet bombers flying at around the speed of sound.

Exercise Foil, which for the first time included air squadrons and operations personnel from Britain's Western Union allies, had progressed sufficiently, it was said, to encourage the service chiefs in respect to two chief factors in the British aerial defense problems.

The first was an extremely high percentage of interceptions at great height by Britain's latest operational jet fighters—the Gloster Meteor and the de Havilland Vampire.

The second was how the incalculable human factor had stood up to the demand for ever-increased speed in spotting and reporting to control centers the presence of enemy aircraft. In both human and material phases of air defense the British experts were reported exceptionally pleased with the results of the exercise.

As Royal Airforce officers began evaluating the lessons learned since Exercise Foil began June 25, the warm summer skies over Britain were filled with the largest force of fighter and bomber formations seen since the war. Superfortresses from the United States Third Air Division, based in Britain, attacked London from high levels during the afternoon and made strategic raids on Birmingham, Manchester, Liverpool, Bristol and Leeds. British and Netherlands jet fighter squadrons manned by regular and by auxiliary personnel made repeated interceptor attacks from varying heights.

Elsewhere in the country British bomber forces also launched assaults on industrial targets while a mock attack on Birmingham by a mosquito bomber fleet was reported to have resulted in "heavy casualties" for the invading force.

The exercise will end officially about 10 o'clock Sunday night, and it is expected that senior airforce officers will hold a press conference at fighter command headquarters, at

Uxbridge near London, afterward to sum up interim impressions. Government Ministers in charge of service departments, including A. V. Alexander, Minister of Defense, and Arthur Henderson, Air Secretary, have been flying to various participating airdromes during the last week to see for themselves how the exercise has been conducted, and similar visits have been made by high-ranking air officers of Britain and the United States and other nations.

New York *Times*, July 7.—London.—Some unpublicized aspects of Britain's recent air exercises that have come to light here bring into better balance the praise that senior Royal Air Force officers and political service chiefs lavished on the British military aviation last Sunday.

Despite the claim that Britain still "leads the world in fighter aircraft", it should, in fairness, be pointed out that neither the British fighters nor bombers operated during this exercise at higher than 35,000 feet for the simple reason that they could not. Above this ceiling, some experts say that Britain is "wide open" to air attack.

For the moment no power except the United States is known to have an effective bomber force capable of operating above 35,000 feet although the Soviet Union is trying to build one. Britain's two standard jet fighters, the Gloster Meteor and the de Havilland Vampire, can catch any known bomber below this level but for interception above it Britain must rely for some time yet on rockets guided to their targets by a secret combination of radio controls and proximity fuse.

A TROUBLESOME ASPECT

A troublesome aspect of the problem is the fact that the higher jet fighters operate the more their speed drops, partly because of the increasing "thinness" of the air that must be sucked into the jet engines. Until this disability is overcome, it is thought that even slow-flying bombers—provided they can attain the necessary height—will be able to pass right over pilot-manned fighter defenses.

Another problem that is giving Britain's air experts concern is the lag in radar development here vis-a-vis the increasing speeds

and operating heights of new aircraft. British radar is still largely of wartime vintage, with a standard operating range of approximately 130 miles—equal to about ten minutes warning of the approach of high speed, high level aircraft. Britain's Meteor fighter needs more time than this to climb to 35,000 feet.

The United States has developed the best and most compact radar apparatus capable of being transported in a high-speed fighter, and British air experts are keen to make this equipment standard throughout the Royal Air Force. Technicians of the two countries have been consulting for months on standardization between the Royal and the United States Air Forces, but none of them has been able to solve the key problem of dollar exchange.

The RAF Fighter Command, it is reported, is planning to replace its standard Meteor fighter, which has come to the limit of its development with the latest-type de Havilland Vampire, equipped with the new "thin" wing. This wing will give greater speed and rate of climb, but it will also reduce the present wing-loading capacity.

This may result in the replacement of the present twin-Goblin jet engines, of 3,500 pounds thrust each, with a single "souped up" Rolls Royce Ghost engine of 5,500 pounds thrust. Alterations may also entail the addition of wing-tip tanks for added range and until these can be jettisoned in flight it will mean less maneuverability and slower climbing speed.

One of the principal factors worrying air officers in charge of the recent RAF exercises is continuing shortage of manpower. Planners of the exercises, for instance, were forced to abandon the normal wartime techniques of "saturating" the defenders with a variety of attacks from different heights and directions and at varying speeds, and, instead, could merely send in one main attack at a time, with two or three minor feint attacks to confuse the defenders.

It was reported that the personnel of the RAF and ancillary organizations stood up well during the ten-day maneuvers but RAF men know the problems facing them in "Exercise Foil" were a far cry from what the RAF handled in the recent war—or what it

believes will face it if war ever comes again to Europe.

EDITORS NOTE: Draw your own conclusions from above two reports.

British Bombers for Greece

The Aeroplane, June 10.—During the past 12 months 74 fighter bombers have been delivered to Greece on request and against payment. Of these 20 were ordered in January, 1948, and delivered in July, 1948; delivery of 54 ordered in August, 1948, is just being completed. No aircraft in other categories have so far been delivered, but by August outstanding requests for 24 training and 12 transport aircraft ordered in March and April of this year would be met.

This information was given in the House of Commons on June 1 by Mr. Mayhew on behalf of the Secretary of State for Foreign Affairs in reply to a question by Major Tufton Beamish (Cons. Lewes) who, in a supplementary question, asked why the Greek Air Force was kept short of Spitfires during the whole of the Winter campaign, when Spitfires were obsolescent craft in this country. He suggested that the urgent need in Greece was for fighter bombers and light bombers.

MERCHANT MARINE

Merchant Fleet Keeping Strength

New York Times, July 17.—The growth of foreign merchant fleets and their increased competition, combined with a leveling off of United States foreign trade, have had little effect on the size of the active privately owned merchant marine, the National Federation of American Shipping, Inc., reported yesterday.

In making public at Washington its semi-annual report on the status of our merchant marine, the federation found that the privately owned fleet had declined by only twenty-three ships since the first of the year. This decrease, the report added, was due primarily to the withdrawal of older and less efficient ships.

On July 1, the privately owned fleet comprised 1,193 ships with an approximate dead-weight tonnage of 14,100,000 as compared with 1,216 vessels of over 14,200,000 dead-



Photograph Courtesy of Grace Line

THE BRIDGE ON A MODERN AMERICAN LINER

The privately owned merchant fleet on July 1, 1949, comprised 1,193 ships totalling approximately 14,100,000 deadweight tons.

weight tons on Jan. 1, 1949. A breakdown shows that 712 ships were dry cargo and combination vessels, of about 7,100,000 deadweight tons, and 481 were tankers of about 7,000,000 deadweight tons.

This fleet of 1,193 ships was employed in the following trades:

	Dry Cargo	Tankers
U. S. foreign trade	517	170
Non-contiguous territorial trade	45	5
U. S. coastwise trade	60*	216
U. S. intercoastal trade	25	5
Temporarily inactive	85	65

* Includes Colliers.

The number of Government-owned ships under bareboat charter to private operators stood at 344 on July 1, or only fifteen below

the Jan. 1 total. This, the report noted, is in contrast with the sharp decline of bareboat chartered vessels in 1948.

With the removal of C-4 type passenger vessels from general agency agreements, this type of operation is virtually ended.

As to the position of the Government-owned National Defense Reserve Fleet, the report found that the ships had been reduced from 1,902 on Jan. 1 to 1,876 on July 1.

Ships Under Close Watch

New York Times, July 9.—One of the most intensive guarding programs ever applied to American shipping is gradually taking form along the port's waterfront, according to reports from shipping sources yesterday.

Department of Justice agents, including immigration inspectors, Federal Bureau of

Investigation men and special officers are being assigned to an increasing number of ships, operators said. All three of the so-called Iron Curtain vessels that were in port last week were under special scrutiny when they arrived and the vessel that sailed received a more careful watching.

The *Batory* of the Gdynia-America Line came in and sailed under surveillance, and at the time it was said by Immigration and Naturalization officials that the watch was to keep crew members on board. Despite the guard three escaped, but were taken in custody later.

Yesterday at 3:10 P.M. the Russian freighter *Dmitry Donskoi*, on which United States Government attention has been the subject of representatives by the Soviet Embassy in Washington, pulled away from her pier at Bayway Terminal, Elizabeth, N. J. She had been under constant guard since her arrival and her crew was carefully checked off to see that none remained and that no unlisted passenger sailed without official knowledge.

The Yugoslav freighter *Tupusko* docked in Brooklyn a week ago with cargo and eight passengers and is to sail from Pier 96, North River, late next week. She was also given a special guard.

It also developed that the Federal attention is not being limited to ships flying Iron Curtain flags.

Spokesmen for the Immigration and Naturalization Service's district headquarters, at 70 Columbus Avenue, declined to comment on the expansion of the passenger surveillance program. Shipping operators, however, said emphatically that ship movements, and departures in particular, were now the object to Federal watchfulness unprecedented in peacetime.

War Risk Pay In Chinese Waters

New York Times, July 16.—San Francisco.—Payment of war risk bonuses to seamen on ships entering Chinese coastal waters is provided in a ninety-day agreement signed by the Pacific Maritime Association with two American Federation of Labor seagoing affiliates, the Masters, Mates and Pilots, and the Sailors Union of the Pacific. The provision became effective on Wednesday.

Members of the two unions are to receive an additional 75 to 100 per cent of their base pay while they are in an area extending from a point north of Hong Kong up to the Korean peninsula and 150 miles out to sea. This bonus is in addition to a \$2.50 daily war-risk bonus established during World War II.

The provision was negotiated after the Chinese Nationalist Government had informed the United States Embassy that it would blockade all ports held by the Communists.

The average \$750 monthly base wage of masters and the \$226 base pay of sailors will be doubled in an area from Lat. 26 degrees 15 minutes N. to Lat. 33 degrees N. Seventy-five per cent bonuses are payable upon entry into coastal waters lying to the north and south of this area.

A spokesman for the Pacific Maritime Association said tonight that a bonus agreement for China waters also had been reached with the CIO Cooks and Stewards and that others were being negotiated with the CIO Marine Engineers and the independent Marine Firemen. So far the employers have not met with the radio operators for this purpose.

SCIENCE

Ship Stabilizer

Christian Science Monitor, July 16.—New York.—The United States Navy may soon take the "bound" out of the bounding main.

Naval engineers have devised a new ship-stabilization system designed to reduce the rolling motion of vessels by 80 per cent, according to Third Naval District Headquarters here. Extensive sea tests of the "activated tank" method now are planned at the Naval Shipyard, Norfolk, Va.

Successful stabilization would greatly improve the accuracy of shipboard weapons, say naval ordnancemen and engineers. It would simplify carrier landing operations and expedite the discharge of cargo and troops from anchored vessels in open seaways.

Carrying a prototype of the system, the *Peregrine*, a large minesweeper, will test its effectiveness in rough weather at sea off the Virginia capes in August. Naval engineers and architects have studied the method for a

number of years, but no sea tests have been made since the addition of recent modifications.

Built to operate on a counter-balance principle, the new stabilizer consists of two pairs of large tanks mounted on opposite sides of the ship, the navy explains. Each tank is half filled with ballast water. Transfer ducts across the ship connect the bottoms of the tanks.

Electronic equipment detects the ship's roll almost before it starts and sets pumps at work shifting the water rapidly back and forth to offset the rolling motion, according to the navy.

The system would "cost in weight" less than some other stabilizers (about 1 per cent of a ship's displacement), naval engineers believe. It would increase a ship's monetary cost by about 3 per cent and require 2 per cent of its propulsive power, the engineers estimate.

Naval experiments with the system began in 1937. Suspended in 1940, they were resumed after World War II.

Camera-Developer-Projector For Radar

New York *Times*, June 28.—Huntington, L. I.—A newly perfected device that photographs objects and then reproduces them in great detail on a large projection screen only four seconds later, after complete processing of the film, was demonstrated here today.

Fabricated at the request of the United States Air Force, the high-speed camera-developer-projector was designed to facilitate the work of radar specialists. It may be used in a radar "fence" if one is thrown around the North American Continent.

At present radar search screens are kept in constant view of radar technicians who manually reproduce on a board the aerial traffic in their individual sections of the radar screen.

The new device, developed here at the plant of the Kenyon Instrument Company, Inc., would photograph constantly the radar screen and project the pictures of the radar-viewed sky traffic on a ten-foot screen. The "brass" controlling Air Force flights, then would be able to sit back and watch the automatic projections.

The instrument was demonstrated by Clifton Tuttle, who with Fordyce M. Brown developed it in the last year. Both men are research physicists at the Kenyon laboratory.

Mr. Tuttle placed in front of the camera part of the un-named machine a sketch whose intricate lines resembled the engraving on paper currency. Seconds later the projector on the back of the device threw a picture of the sketch on a wall screen. Pages of newspapers, calendars and other printed matter also were reproduced.

Although the invention was made for the Air Force, it is probable that it will be used by other agencies. Mr. Tuttle said that representatives of Johns Hopkins Medical School had suggested use by mobile X-ray units.

The device probably will sell for \$10,000 when put into production, Mr. Tuttle estimated. Three have been made so far. Two will go to the Air Force's Watson Laboratories at Red Bank, N. J., and the other will be taken to the Army Signal Corps headquarters. The machine is compact, about four feet tall and two feet square. It uses thirty-five millimeter film.

"The speed is achieved by having the solutions at about 135 degrees Fahrenheit," Mr. Tuttle related. "The developing takes less than a second, the fixing a little over two seconds and the washing and drying less than a second."

Four hundred feet of film are placed in the machine at once. It can then run at high-speed for seven hours without being touched. The tanks of developer, fixing solution and rinsing water are big enough for twelve hours of continuous operation.

Another invention was made in connection with the fast-camera projector. The device is a projection machine that incorporates the features of a motion-picture projector and a slide projector. When operated in conjunction with the speed camera the pictures on the film remain on the screen from a fraction of a second to thirty seconds.

INTERNATIONAL

Western Union Naval Exercises

London *Times*, June 11.—The Admiralty has issued some details of the naval exercises

which are to be carried out at the end of this month by ships from the British, French, Netherlands, and Belgian Navies, under the supreme command of Admiral Sir Rhoderick McGrigor, Commander-in-Chief of the Home Fleet. More than 100 men-of-war in all will take part, ranging from a battleship and several carriers to motor torpedo-boats.

The British, French, and Dutch ships, other than minesweepers, will assemble in Mounts Bay, off Penzance, on Thursday, June 30, for the exchange of official visits and harbour drills. On Monday, July 4, they will sail for exercises in the Bay of Biscay, while minesweeping exercises, in which Belgian ships will also participate, will take place in the Channel. Both ships and minesweepers, at the conclusion of their respective exercises, will assemble in Weymouth Bay on Thursday, July 7.

The French senior officer will be Vice-Admiral R. G. Lambert, flying his flag in the cruiser *Montcalm*, and there will be two other French admirals; the Dutch senior officer will be Rear-Admiral J. J. L. Willinge with his flag in the cruiser *Tromp*. Besides the Commander-in-Chief, with his flag in the fleet-carrier *Implacable*, the British Rear-Admirals Mansergh, Commanding the 3rd Aircraft Carrier Squadron, Slayter, Commanding the 2nd Cruiser Squadron, and Anstice, Commanding Training battleships, will be afloat.

MISCELLANEOUS

Questions A-Bomb Blitz

Christian Science Monitor, July 2.—Washington.—It would take as many as 6,500 atomic bombs to totally destroy the cities of



Official U. S. Navy Photograph

THE WRECKAGE OF ATOM-BOMBED NAGASAKI

One bomb specialist estimates that it would require 6,500 atom bombs to totally destroy the cities of a major military power.

a major military power, an authority on strategic air war estimates.

This comes from D. Stefan T. Possony, a specialist on bomb target selection for France during the first part of World War II, later a psychological warfare expert for the United States Navy after the fall of France.

His calculations on the enormous number of atomic bombs required, coupled with a detailed analysis of the limitations as well as capabilities of existing bomber fleets, questions the theory of an "atomic blitz" to defeat an enemy in a quick war. He cautions that "the destructiveness of a weapon is dependent on the quantity in which this weapon can be made available."

Dr. Possony, currently lecturing on military subjects at Georgetown University, set down his views in a volume on "strategic air power for dynamic security," published by the Infantry Journal.

VAST DESTRUCTIVE POTENTIAL

Dr. Possony used Germany, in its wartime condition, as an example of estimating the number of atomic bombs necessary for a war of "total destruction" against urban areas. He chose that country because statistics are available for destruction wrought by conventional bombs.

The havoc produced by one atomic bomb is equal to about 4,000 tons of conventional bombs, based on the actual damage produced by the blast, Dr. Possony estimates. This, as he points out, is different from the strictly theoretical figure (based on mere measurement of blast) of one atomic bomb equaling 20,000 tons of TNT. That estimate was made in the first official announcement of the atomic bomb, at the time of the 1945 attack on Hiroshima.

Dr. Possony discusses in cold but alarming statistics the toll expectable if an atomic attack should be launched against the United States—but challenges a statement that 40,000,000 persons would be killed in the first 24 hours.

"Even if the bomb were considerably more effective than it actually is, it would be hard to find masses of people so great assembled in a targetable concentration," he writes. "In order to kill so many, it would be necessary, for example, to destroy some 90 cities cover-

ing an area of approximately 4,500 square miles. . . . Making allowance for one-third operational failures and inaccurate drops, and for a 50 per cent rate of interception (of the attacking bombers) if the attacks were run on single missions, about 10,000 atomic bombs would be easily required for such an extermination attack. That many atomic bombs will hardly be available as long as atomic technology remains as complicated as it is, but this is little solace.

But—"we can calculate that at least a million people will be killed" for each 135 atomic bombs loaded into bombers, allowing for misses and planes shot down en route, Dr. Possony says.

Fortunately for mankind, the cost of killing men has risen steadily with each war, he observes. It cost Caesar 75 cents to kill each enemy soldier; Napoleon \$3,000; \$25,000 per man in World War I; \$50,000 with the technology of World War II.

While Dr. Possony expressed serious doubts about the ability to annihilate the urban population of a nation by "total destruction" attack with atomic bombs, he contended their use against "selective" targets of industry would assure victory. Such attacks would wipe out an enemy's war-making ability and make him incapable of continuing the fight.

Without mentioning any particular type of plane or referring to the current controversy over the long-range B-36, Dr. Possony discussed "the crisis of the heavy bomber."

"At present, the fighter units of all important air forces are partially equipped with jets, and we may guess that within a few years there will be only jet fighters," he said. "It is possible that within several years the major air forces will also have heavy jet bombers, but these may be usable only at medium range or for one-way missions.

JETS KEY AIR FLEETS

"For long-range, two-way heavy bombardment, it seems probable that piston engines will still have to be used, but against jet fighters their chances of survival are slim. And they are even more dangerously exposed to attack by guided missiles of the ground-to-air type. To get a minimum of protection,

piston-engined heavy bombers must withdraw to maximum altitudes.

"Some people without imagination deduce from these facts that at present long-range air power is 'not existent' and that long-range bombardment will never be feasible. Actually, of course, it should eventually be possible to solve these problems."

Among possible solutions he mentions aerial refueling, towing bombers over part of their route to a target to save their fuel and increase their range. But he emphasizes the need, under present conditions, of bases within reasonable striking distance of enemy territory.

"Tomorrow's master of the air will be the nation that will be in possession of a large number of long-range heavy jet bombers," Dr. Possony asserts. "The master of the air the day after tomorrow will be the nation that will first be in possession of atomic aero engines. That nation . . . will hold the fate and freedom of the world in its hands. Let us hope that this nation will be the United States."

State Department Couriers

New York *Herald Tribune*, July 4.—Eighty-five men make up an exclusive mail system for the use of the State Department alone. Traveling mostly by air, these men, called couriers, rush diplomatic secrets around the world to 163 diplomatic posts scattered in foreign lands.

They travel set routes every week. Two men leave for South America each week, and each week two men return from South America. All along the line they drop off mail (confidential and secret orders) and pick up mail (secret and confidential information).

At various points couriers' paths cross, and they swap pouches to speed up mail delivery. Panama, Paris, Cairo and Bangkok are the major swapping points.

The mail is carried in locked brief cases or "pouches," and the courier seldom knows what secrets he's guarding. But he must stay with his mail until its delivery, sometimes sleeping on it when he has a heavy load to guard. On trains, when the load is heavy, he takes a compartment.

NONE EVER ROBBED

Not a single courier has ever been robbed of his pouch since the courier system was started in 1940. No pouch has ever been lost, no courier has ever been hit on the head by a sinister foreign spy, and as far as the lads know no Mata Hari has ever wagged a finger at them.

It's just a weary business of riding planes day after day, sometimes as much as twelve hours a day, for seven days running, and keeping an eye on the pouches.

These couriers do about 200,000 miles of travel a year and most of them, before they finish, have seen the crossroads of the world. But the record shows most of them are sick of travel in six months and quit the job before two years are over.

The worst dangers they meet are unsanitary foreign restaurants, lost shirts, lost sleep and terrific changes in temperature as they wing across the globe.

The average courier is thirty years old. He is picked for health, proven loyalty and quick intelligence. Most of them look like handsome young detectives. They must be twenty-one to thirty-one years old and unmarried when they are hired.

The courier's greatest worry is to keep moving on schedule so that he won't fail to meet other couriers with whom he is supposed to swap pouches.

ONLY ONE LOST IN PLANE CRASH

For all the flying, courier headquarters reports only one man lost in a plane accident, and he wasn't on duty.

On duty the couriers can't drink or play cards. They are supposed to avoid talk with strangers and to be vague about their jobs. But they do have a little fun at the ends of their runs, getting a night off here and there around the world. Their shopping street may run through five or ten countries. Men on the South American run buy their woollens in Buenos Aires and their silver in Lima.

They know good restaurants from here to Mandalay and they have worked out systems for dropping off their laundry, say in Rio de Janeiro, hopping on to Buenos Aires and then stopping back for clean shirts.



Official U. S. Navy Photograph

FAMILIAR SIGHT TO DIPLOMATIC COURIERS

Travelling regular routes, the State Department couriers carry mail and dispatches to 163 diplomatic posts scattered all over the world



Official U. S. Coast Guard Photograph

GREATER SAFETY AT SEA

A new type lifeboat davit being tested by the U. S. Coast Guard. Swinging like an inverted pendulum, the davits lower boat, crew, and cradle into the sea.



Monthly Meeting of the Board of Control

At its monthly meeting on July 12 last, the Board of Control of the U. S. Naval Institute analyzed and approved the proposed budget for the coming year. The Board appointed Captains Richard F. Stout, Kenneth Craig, and Edward K. Walker, U.S.N., as a committee to nominate candidates for the Officers of the Institute for the approaching annual election.

Annual Dues

At its meeting the Board of Control also considered carefully the question of an increase of annual membership dues in the Naval Institute, which membership carries with it, without additional cost, a year's subscription to the UNITED STATES NAVAL INSTITUTE PROCEEDINGS. Prior to December, 1942, membership dues were \$3.00 per year; in December, 1942, annual dues were reduced to \$2.00 per year, at which figure they have remained ever since. Since that date, however, paper and printing costs for the PROCEEDINGS alone have increased 64 per cent. In view of greatly increased paper and printing costs, most other publications have long since increased their prices. For instance, *Life Magazine* has increased its price from an original 10 cents to 20 cents per copy, an increase of 100 per cent. *Collier's* and the *Saturday Evening Post* have each increased their prices from 5 cents to 15 cents per copy, an increase of 200 per cent.

In the field of service publications similar to the UNITED STATES NAVAL INSTITUTE PROCEEDINGS, *Air Force*, a monthly magazine of 48 pages (compared to the 144 pages in the PROCEEDINGS) has an annual subscription rate of \$4.00. *The Infantry Journal*, a monthly magazine of 64 pages, has a cost to members of \$3.50 per year. *Mast Magazine* (the U. S. Maritime Service), a monthly magazine of 40 pages, comes to members at a cost of \$3.00 per year.

In view of the vastly increased costs of paper and printing, the Board of Control regretfully voted to increase the annual dues of members and associate members in the United States Naval Institute from \$2.00 back to the original \$3.00 in effect before December, 1942, this increase to begin with membership dues for 1950. This is only a fifty per cent increase above present dues, and is still considerably less than equivalent dues in other service organizations publishing magazines far less in size and cost than the UNITED STATES NAVAL INSTITUTE PROCEEDINGS. The Board proportionately increased the PROCEEDINGS' yearly subscription rate for non-members from \$4.00 to \$5.00, effective January 1, 1950.

More Safety at Sea

The U. S. Coast Guard, always a leader in developing equipment for insuring safety at sea, recently tested a revolutionary new cradle-and-davit system of lowering and hoisting lifeboats on vessels at sea. The cradle, originally developed by F. Forrest Pease of Boston, Mass., operates in connection with pivoted davits which swing cradle and boat and crew, in inverted pendulum fashion, out from the ship's side and into the water, and then hoist the whole aboard in similar but reverse fashion. Not only vastly increased safety for boat crews and passengers, but vastly increased speed in lowering and hoisting, seems promised by the new development.

Special Notice

U. S. Naval Institute General Prize Essay Contest, 1950

A PRIZE OF NOT LESS THAN \$500 and of not more than \$1,500, a gold medal, and a life membership in the Institute will be awarded for the best essay submitted on any subject pertaining to the naval profession, should the Board of Control consider the essay to be of sufficient merit. Should the prize be awarded to a previous winner, a gold clasp suitably engraved will be given in lieu of the medal and the commuted value of the life membership in lieu of the life membership.

Irrespective of the award of the "Prize," one or more essays may receive "Honorable Mention," if of sufficient merit to justify the award. Essays awarded "Honorable Mention" shall receive such compensation as may be adjudged by the Board of Control, but not including a life membership.

In the event that no essay is adjudged of sufficient merit to receive the "Prize" or an "Honorable Mention," the best essay submitted may receive a special award in lieu thereof.

The following rules will govern this competition:

- (1) Essays should not exceed 8,000 words.
- (2) Essays must be received by the Secretary-Treasurer on or before January 1, 1950.
- (3) The name of the competitor shall not appear on the essay, and each essay must have a motto in addition to the title. This motto shall appear (a) on the title page of the essay, (b) on the outside of a sealed envelope containing identification of the competitor, (c) above the name and address of the competitor inside the envelope containing this identification. This envelope will not be opened until the Board has made the awards. Essays and identifying envelope must be mailed in a large sealed envelope marked "General Prize Essay Contest."
- (4) The awards will be made by the Board of Control, voting by ballot and without knowledge of the names of the competitors.
- (5) The awards will be made known and presented to the successful competitors as soon as practicable after the February meeting of the Board.
- (6) All essays must be typewritten, double spaced, on paper 8½" x 11", and must be submitted in triplicate, each copy complete in itself.
- (7) Essays awarded the "Prize," "Honorable Mention," or "Special Award" are for publication in the Naval Institute PROCEEDINGS. Essays not awarded a prize may be published at the discretion of the Board of Control, and the writers of such essays shall be compensated at the rate established for articles not submitted in competition.
- (8) Attention of contestants is called to the fact that an essay should be analytical or interpretive and not merely an exposition or personal narrative.

William G. Cooper,
Captain, U. S. Navy, Secretary-Treasurer

UNITED STATES NAVAL INSTITUTE PROCEEDINGS

*For the advancement of professional, literary and
scientific knowledge in the Navy*

October, 1949

Edited by CAPTAIN W. G. COOPER, U. S. NAVY

Managing Editor—COMMANDER ROY DE S. HORN, U. S. NAVY (RET.)

Associate Editors

CAPTAIN JOSEPH M. P. WRIGHT, U. S. NAVY

COMMANDER C. P. LEMIRUX, U. S. NAVAL RESERVE (INACTIVE)

LIEUTENANT COMMANDER H. O. WERNER,
U. S. NAVAL RESERVE (INACTIVE)



United States Naval Institute

Publication Office: Menasha, Wisconsin

Editorial and Business Office: Annapolis, Maryland

Advertising Department: 2000 Connecticut Ave. N.W., Washington, D.C.

Copyright, 1949, by U. S. Naval Institute

Officers of the Institute

PresidentADMIRAL LOUIS E. DENFELD, U. S. NAVY
Vice-PresidentREAR ADMIRAL JAMES L. HOLLOWAY, JR., U. S. NAVY
Secretary-TreasurerCAPTAIN W. G. COOPER, U. S. NAVY

Board of Control

ADMIRAL LOUIS E. DENFELD, U. S. NAVY (ex officio)
REAR ADMIRAL JAMES L. HOLLOWAY, JR., U. S. NAVY (ex officio)
REAR ADMIRAL ELLIS REED-HILL, U. S. COAST GUARD
REAR ADMIRAL JOHN W. ROPER, U. S. NAVY
CAPTAIN ARLEIGH A. BURKE, U. S. NAVY
CAPTAIN M. A. SAWYER, U. S. NAVY
CAPTAIN ROBERT B. PIRIE, U. S. NAVY
MAJOR JOHN E. WILLIAMS, U. S. MARINE CORPS
CAPTAIN W. G. COOPER, U. S. NAVY (ex officio)

Past Presidents

ADMIRAL DAVID D. PORTER, U. S. NAVY, 1873
REAR ADMIRAL JOHN L. WORDEN, U. S. NAVY, 1874
REAR ADMIRAL C. R. P. RODGERS, U. S. NAVY, 1875-78
COMMODORE FOXHALL A. PARKER, U. S. NAVY, 1878-79
REAR ADMIRAL JOHN RODGERS, U. S. NAVY, 1879-82
REAR ADMIRAL C. R. P. RODGERS, U. S. NAVY, 1882-83
REAR ADMIRAL THORNTON A. JENKINS, U. S. NAVY, 1883-85
REAR ADMIRAL EDWARD SIMPSON, U. S. NAVY, 1885-87
REAR ADMIRAL STEPHEN B. LUCE, U. S. NAVY, 1887-98
REAR ADMIRAL WM. T. SAMPSON, U. S. NAVY, 1898-1902
REAR ADMIRAL H. C. TAYLOR, U. S. NAVY, 1902-1904
REAR ADMIRAL C. F. GOODRICH, U. S. NAVY, 1904-1909
REAR ADMIRAL RICHARD WAINWRIGHT, U. S. NAVY, 1909-11
REAR ADMIRAL BRADLEY A. FISKE, U. S. NAVY, 1911-23
VICE ADMIRAL WILLIAM L. RODGERS, U. S. NAVY, 1923-24
ADMIRAL HENRY B. WILSON, U. S. NAVY, 1924-26
ADMIRAL HILARY P. JONES, U. S. NAVY, 1926-28
REAR ADMIRAL EDWARD W. EBERLE, U. S. NAVY, 1928-29
ADMIRAL S. S. ROBISON, U. S. NAVY, 1929-31
REAR ADMIRAL M. L. BRISTOL, U. S. NAVY, 1931-33
ADMIRAL WILLIAM H. STANDLEY, U. S. NAVY, 1933-35
ADMIRAL DAVID FOOTE SELLERS, U. S. NAVY, 1935-37
FLEET ADMIRAL WILLIAM D. LEAHY, U. S. NAVY, 1937-40
ADMIRAL H. R. STARK, U. S. NAVY, 1940-42
FLEET ADMIRAL CHESTER W. NIMITZ, U. S. NAVY, 1942-43
FLEET ADMIRAL E. J. KING, U. S. NAVY, 1943-46
FLEET ADMIRAL CHESTER W. NIMITZ, U. S. NAVY, 1946-48

October

Vol. No. 75, No. 10

Contents

1949

Whole No. 560

For the Advancement of Professional, Literary, and Scientific Knowledge in the Navy

VULCAN'S WORKSHOP—MANUFACTURING GIANT NAVAL CANNON AT THE
U. S. NAVAL GUN FACTORY, WASHINGTON, D. C. *Front Cover*
Official U. S. Navy Photograph

SEA POWER AND A NATIONAL GENERAL STAFF. 1091
By Lieutenant Colonel J. D. Hittle, U. S. Marine Corps

ADMIRAL YAMAMOTO. 1105
By James A. Field, Jr.

PREFACE TO LEADERSHIP. 1115
By Herbert G. Telsey

NAVY OVERLAND TRANSPORTATION METHODS IN THE POLAR REGIONS. 1123
By George W. Grupp

THE HISTORIC FLIGHT OF THE CORAL SEA NEPTUNES. 1129
By Lieutenant Commander M. W. Cagle, U. S. Navy

A CHALLENGE FOR THE LINE OFFICER. 1133
By Commander James C. Shaw, U. S. Navy

THE SHAPE OF TOMORROW'S TORPEDO. 1145
By Warren Hughes

BATTLESHIP BANZAI!. 1151
By Captain Waller Karig, U. S. Naval Reserve (Ret.), Lieutenant Commander Russell Harris, U. S. Naval Reserve, and Lieutenant Commander Frank A. Manson, U. S. Navy

ROUND-SHOT TO ROCKETS. 1159
By Lieutenant Commander Harry C. Allendorfer, U. S. Navy

THE WASHINGTON NAVY YARD AND U. S. NAVAL GUN FACTORY (*Pictorial Section*) 1166

DISCUSSIONS, COMMENTS, NOTES. 1177

BOOK REVIEWS. 1181

PROFESSIONAL NOTES. 1187

SECRETARY'S NOTES. 1205

The opinions or assertions in the articles are the private ones of the writers, and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

Published monthly at 450 Ahnaip St., Menasha, Wis.
Executive, Editorial and Business Offices, U. S. Naval Institute, Annapolis, Md.
Advertising Department, Suite 710, 2000 Connecticut Ave., N.W., Washington, D.C.
Entered as second-class matter at the post-office at Menasha, Wis., April 4, 1922, and at the post-office at Annapolis, Md., under Act of August 4, 1912. Acceptance for mailing at the special rate of postage provided for in section 1103, Act of October 3, 1919, authorized March 13, 1922.
Membership dues (including PROCEEDINGS), \$2.00 a year.
Subscription rate, \$4.00 a year. (Foreign postage, \$1.00 extra.) Single copies 50 cents.

He finds trouble by ear



As this cableman runs his pickup coil along the cable, his ear tells him when he has hit the *exact spot* where unseen trouble is interfering with somebody's telephone service.

Trouble develops when water enters a cable sheath cracked perhaps by a bullet or a flying stone. With insulation damaged, currents stray from one wire to another or to the sheath. At the telephone office, electrical tests on the faulty wires tell a repairman approximately where to look for the damage.

A special "tracer" current, sent over the faulty wires, generates a magnetic field. Held against the sheath, an exploring coil picks up the distinctive tracer signal and sends it through an amplifier on the man's belt to headphones. A change in signal strength along the cable tells the exact location of the "fault."

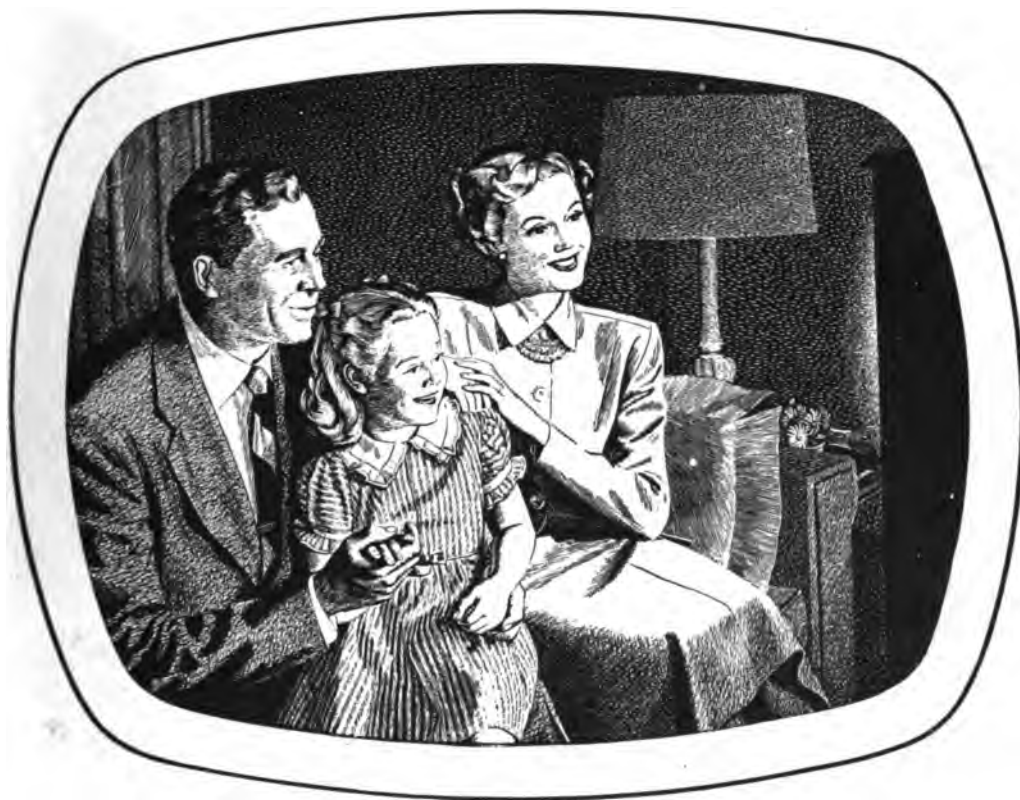
Compact, light, simple to use, this test set makes it easier for repairmen to keep your line in order. It is another example of how Bell Laboratories research helps make Bell Telephone service the most dependable in the world.

BELL TELEPHONE LABORATORIES

Exploring and inventing, devising and perfecting, for continued improvements and economies in telephone service.



NOW...CAPEHART TONE ADDS A NEW DIMENSION TO TELEVISION!



Under I T & T sponsorship, Capehart brings television to *life*. See the look of wonder and delight reflected in the face of a person *hearing* Capehart television. Here is tone quality that rounds out the finest image yet produced by television techniques. It is the superb tone that won world fame for the Capehart phonograph-radio...tone that only Capehart has produced.

Capehart television is the first fruit of the new association between International Telephone and Telegraph Corporation and Capehart-Farnsworth Corporation. I T & T is proud to join its world-wide resources for research and engineering to the pioneering names of Capehart and Farnsworth, in a program devoted to the development of "better television for more people."



WORLD UNDERSTANDING THROUGH WORLD COMMUNICATIONS

INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION
New York, N. Y.



Official U. S. Coast Guard Photograph

FIRM ADVOCATES OF A NATIONAL GENERAL STAFF

Captured Nazi officers bound for internment camps in World War II. Prussia developed the archetype of the supreme general staff.

UNITED STATES NAVAL INSTITUTE PROCEEDINGS

Vol. No. 75, No. 10

OCTOBER, 1949

Whole No. 560

SEA POWER AND A NATIONAL GENERAL STAFF

By LIEUTENANT COLONEL J. D. HITTLE, *U. S. Marine Corps*

A NATIONAL general staff and strong sea power cannot, at the same time, exist in the same country.

Present efforts to create a supreme general staff in the United States are nothing particularly new. Ever since World War I, when our national military thinking was brought into intimate association with European thought, there has been an unceasing clamor for the adoption of such a system of over-all armed forces control for our air, naval, and land forces. Repeatedly Congress has considered bills having as their principal objective the establishment of a supreme general staff. Just as frequently, Congress has consistently rejected the proposals, judging a national general staff to be inappropriate to the requirements of our national security and antithetical to the democratic character of our government.

Historically the national general staff is a product of continental European military thought, the brain-child of a land-locked military intellect. Prussia developed the arch-type of supreme general staff, and it has since been, with good reason, referred to as the Prussian system.

The opinions or assertions in this article are the private ones of the author, and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

In its basic form a national general staff is not complex. Its essential attributes are a top-level staff organization headed by one officer possessing the power of decision. That power of decision may be legally vested in that individual; it may be a power of decision that has been delegated by higher governmental authority; or it may be usurped, the latter process having frequently been adopted when power did not accrue with sufficient speed. Regardless of what it is called, when one man, assisted by a staff, directly or indirectly exercises power of decision over all land, sea, and air elements of a country's armed forces, then that country has a national general staff.

There is no doubt that a diagrammed structure of a supreme general staff presents an attractive picture to those seeking a simple solution to the problem of over-all control of armed forces. On any graph of such an organization sharp black vertical lines clearly delineate the channels of command. At the bottom of the lines are the heads of three services, land, sea and air. As the lines go upward, the sources of authority pyramid rapidly, converging in the supreme guiding agency, the national general staff headed by the chief of that staff. The very apex of the pyramid of power is the chief of the national general staff. This is a simple and attractive

A GRADUATE of Michigan State College, Lieutenant Colonel Hittle was commissioned in the Marine Corps in 1937. After service on the cruiser *Portland* and with the Fleet Marine Force, he commanded the Marine Detachment on the U.S.S. *Washington* with the British Home Fleet at Scapa Flow shortly after Pearl Harbor. He served with the 3rd Marine Division at Iwo Jima, and after Japan's surrender he commanded the 2nd Battalion along the Peiping-Mukden Railroad in China. After subsequent service as Secretary of the Academic Board, Marine Corps Schools, Quantico, Va., he is at present Executive Officer of the N.R.O.T.C. unit at the University of Utah. He is author of the books, *The Military Staff—Its History and Development*, and *Jomini's Art of War*.

picture of armed forces command. Its attractiveness is also deceptive.

At the peak of this pyramid of military power is the supreme general staff with its chief; and therein lies the fallacy of the concept. It is fallacious because there has never been a supreme general staff that has been able to understand and properly apply the diverse but mutually dependent agencies of land, sea, and air power. The directing force of the supreme staff is its chief, exercising the power of decision as to how the various elements of the armed forces must be employed to realize maximum effectiveness. The job description for a man in such a position calls for an unusual type of genius. There have been a few geniuses in modern military history, but there has never been one capable of adequately performing the duties of the chief of the supreme general staff of a nation whose security depends on the successful application of more than one type of power.

As the history of the supreme general staff concept is traced from its successful use in land-minded Prussia on through its application in the German armed forces, the collective inadequacies of a supreme staff and its chief become increasingly apparent. In keeping with Prussian precedent the Great German General Staff dominated the armed forces of Germany prior to and during World War I. To all practical purposes the Great General Staff was the supreme general staff. Its authority over the nascent, but poten-

tially powerful, German Navy was a practical fact.

There were those in Germany who understood sea power, but such individuals could never prevail over the Great General Staff. Such institutions have the peculiar habit of being able to think in only one kind of power, and since the German army was understandably landminded, its Great General Staff, in effect the supreme national general staff, possessed a land-locked military intellect.

The sea power conscious leaders in Germany quickly learned an axiomatic truth about national general staffs: such institutions have single track—or single power—minds. To the detriment of the German war effort, the Great General Staff was land power minded.

The misunderstood role of German sea power prior to and during World War I was a case in point. After a lifetime of combating general staff landmindedness old Grand Admiral von Tirpitz sadly remarked: "The German people will never understand sea power." With considerably more accuracy, von Tirpitz might have said, "The Great General Staff will never understand sea power." From the practical standpoint this would have been a much more meaningful statement, for it really didn't make very much difference whether or not the German people understood sea power. Germany was a general staff state, and so the only thing that mattered was the understanding of the supreme general staff.

In spite of the provisions of the Treaty of Versailles, the Great German General Staff never did really die. After years of underground existence, the General Staff was brought out into the open and its place in the German nation was defiantly proclaimed by Hitler. The philosophy of the general staff was still land power, and German sea power suffered accordingly.

Anyone who still nurtures the notion that the agencies of sea, land, and air power can live like three happy children within the family of the single general staff should learn well the story of the misfortunes that befell German naval power as the result of the machinations of its enemies within the Nazi supreme staff system. Actually the German

struggle for effective status went to the early days of Hitler's power. In 1933 and 1934, when the German machine first began to flex its muscles, naval leaders began dodging the attacks coming from within the land and air forces of the armed forces.

In 1933 until almost the beginning of the war there was an internal battle on within the German armed forces on the question of the detailed organization of the top-level direction for war. Out of a mass of argument one clearly discernible concept runs through all of the correspondence, regardless of originator: it was the concept of the over-all staff for all of the forces, with a chief or director at the head of that staff.

The principal exponent of the highly centralized supreme staff was General Keitel. In 1933 Keitel was chief of an innocuous agency, a section of the armed forces called "Armed Forces Office," and was charged with general matters pertaining to matériel and war economy matters. This Armed Forces Office warrants close scrutiny, for its rise to power demonstrates again how the process by which the national general staff concept can achieve domination over the armed forces. By the very expedient process of clinging tightly to Hitler's whims and sponsoring reorganization of the armed forces, Keitel assumed increasing power. By 1937 he was able to include the three services that his office would have developed into an Armed Forces Staff. In 1938 he moved to the next step in 1938 when he created, by directive, the "Armed Forces High Command—*Oberkommando der Wehrmacht* (or "OKW" for short)—and named Keitel its chief. The exact form of the top directing agency was to take was the result of the dispute among the chiefs of the three services.

Von Brauchitsch, Commander in Chief of the Army, understood well the nature of the ideal general staff system, and sought to obtain the official recognition of the Army's (and force) primacy within its organization. He readily praised the establishment of the OKW, and then proceeded to stake out his claim for Army domination of that staff. The essence of von Brauchitsch's

proposal was that the chief of staff to the Supreme Commander should also be the Commander in Chief of the Army. If approved, his proposal would have assured the unquestioned continuation of Army domination over the armed forces. It would simplify the matter considerably by official recognition of the domination that had in the past been achieved, however effectively, often by indirection. Von Brauchitsch knew full well the axiomatic principle that in every instance in which a supreme general staff is established, there is one branch of the services, regardless of whatever so-called equality exists among the three branches, that dominates the other services. He meant to settle the question before bickering began. In short, von Brauchitsch's proposal was simply an attempt to impose ground force domination with the least possible effort.

Raeder, spokesman for the Navy, realized what was in the offing for his branch of the armed forces, and he entered the memorandum writing fray, shrewdly acknowledging the principle of the supreme general staff, but offering proposals that would, he hoped, preserve at least a semblance of naval participation in the top level planning. A major feature of Raeder's counter-proposal called for each service staff within the top-level supreme staff to do its own service planning. If for nothing else, this was to ensure that naval planning was not bungled by those whose only interest in naval matters was to gain authority over them.

Hitler brought the memorandum exchanges to a quick conclusion in June of 1938 with the issuance of an executive order outlining the basic features of the OKW. As things eventually worked out, neither Keitel nor von Brauchitsch missed their principal objectives. Both were from the Army; both were General Staff officers. The Army General Staff dominated the OKW throughout its effective life. The only ones who really lost were Raeder and his Navy—and Germany.

The historical truth, known by von Brauchitsch and feared by Raeder, that one branch would dominate the supreme general staff, was quickly manifested. Army General Staff pre-eminence within the OKW sounded the doom of German naval power.

In keeping with precedent, Germanic military thinking did not fully grasp the concept of naval power. German land and air commanders could not understand that modern naval power rested on a foundation of balanced forces. Consequently the need for adequate naval aviation was quite incomprehensible to those who dominated the top staff levels of the Nazi forces.

In the light of what is now known about national general staffs we are able to recognize the unrelenting attack on German naval aviation as an almost natural development. Historically the idea of a single air force has been inseparably associated with the concept of the single national general staff. Almost as a matter of reciprocity, such staffs have resulted in the establishment of a single air force. It must be admitted that the German naval leaders were stubborn people, for as much as they must have realized that the dice were heavily loaded against them, they kept up a bitter rear guard action against their inter-service opponents for several years.

The conflict over naval aviation revolved about one very fundamental question. The single air force enthusiasts openly contended that such aviation as was maintained for naval purposes should be under the command of the German Air Ministry "in every regard." Raeder was enough of a realist to know that this meant that the Navy would not have anything approaching adequate air support. So, in keeping with sound naval thinking, he stoutly contended that naval air units were just as much a part of the fleet as were submarines, and all should be under naval command. Logic may have been on Raeder's side, but since the battle over naval aviation was going to be fought within the supreme staff, the logic of the argument would not in the end counterbalance the strength of the anti-naval Army and Air Force elements of the supreme general staff.

Always the Navy was on the defensive, trying to beat off the Air Force grabs for more authority over naval aviation. In spite of Raeder's continued protests that the naval commanders should have command of all the naval weapons, the single air force proponents succeeded just before the outbreak of the war in putting the Commander-

in-Chief, Air, in policy control over naval aviation. It was not to be the last time that Raeder was forced to yield to the encroachments of those who sought to destroy naval aviation.

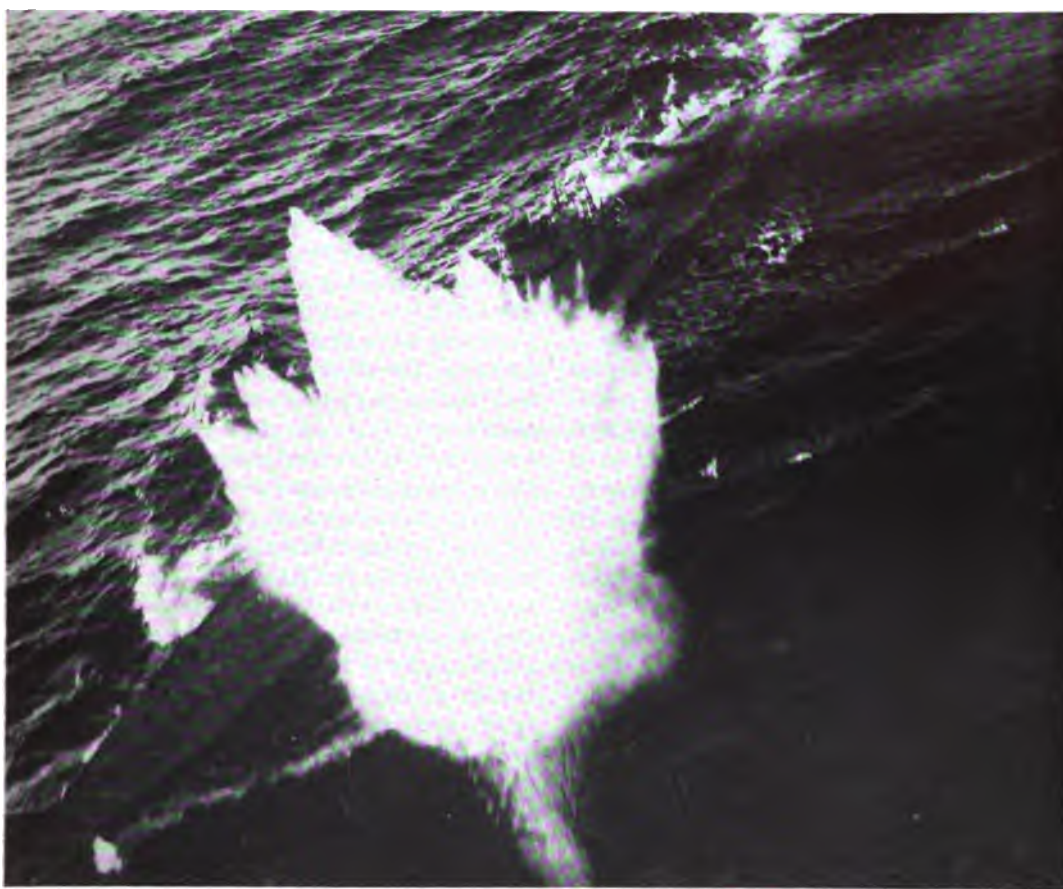
Along with policy control over naval air units went the power of allocation of planes to naval air. With such authority in the hands of the Air Force, naval aviation was never adequate for even reconnaissance purposes.

This began to assume even more serious proportions in early 1940. Then, with the struggle for the North Atlantic moving toward a decision, the role of German sea power was of critical, even decisive, importance. Sound naval policy called for the maximum naval air effort, both in reconnaissance and attack missions.

But at this vital period of the naval war, naval air, instead of being strengthened, was weakened. In 1939 the Commander-in-Chief, Air, had agreed to a definite number of planes to be allocated for naval purposes. But then in 1940, when increased naval aviation was urgently needed to help cut the North Atlantic convoys, naval aviation was reduced. Technically, the Air Force commander did not violate his prior agreement. But he did violate it in spirit. The total number of squadrons agreed upon was not altered. He merely directed the reduction of the number of planes per squadron.

Nor was Air Force interference limited to control of units and material. The incursion into the Navy's sphere of responsibility even went so far that the Air Force disapproved the use of aerial torpedoes, judging them to be "uneconomical," and refused to furnish naval air units with the necessary fittings to equip the planes to carry torpedoes. However, later, when the value of aerial torpedoes was established beyond dispute, the Air Force admitted the need of such a weapon, and proceeded to organize its own torpedo squadrons.

The story of aerial mining operations is similar to that of the aerial torpedoes. As soon as the air mines became available, the Navy saw their value and was interested in their immediate use. Goering, as head of the Air Force, opposed naval air mining operations, contending that none should be used



Official U. S. Navy Photograph

HELPLESS WITHOUT AIR SUPPORT OF THEIR OWN

The German Navy's submarine effort was hopelessly handicapped due to lack of adequate naval air reconnaissance.

until 5,000 mines were ready. Then, later, when mining operations were begun, the Air Force requested that all such operations be conducted by the 9th Air Division of the Air Force, because naval air units did not have the necessary planes to carry out such missions. The Navy agreed to the request. It could do little else; the Commander-in-Chief, Air, had planned it that way.

But the onslaught against naval aviation, and sea power, did not end with this major triumph by the head of the single air force. No, nothing but the complete destruction of naval air would be consonant with the philosophy of a single air force. Since the single air force was in harmony with the concept of a national general staff, the relentless battle against the Navy's air arm continued, with

the issues being fought out within the OKW, thus providing the opponents of naval air with a battle site of their own choosing. In such a position Raeder could not hope to win. Always there was issue being raised by the Commander-in-Chief, Air. If it looked as though Raeder would be forced to yield, or at least agree to an unhappy compromise, the ground force members of the OKW remained apart from the dispute, much as if sitting at the ringside and watching their favorite belt a hopelessly outmatched opponent through the ropes.

But let there be no mistaken idea that the ground force members of the OKW (the national general staff) were reluctant to enter into the dispute over naval aviation. In fact they willingly took sides and acted the

parts of the interested parties that they were whenever it appeared that the defenders of naval air might gain an important point.

For instance, by September of 1940 the position of naval aviation had deteriorated to the point where the Commander-in-Chief, Air, began issuing orders directly to naval air units directly under naval command. On one occasion a naval air group engaged in vitally important reconnaissance over the North Sea was ordered to participate with the Air Force in the attacks on London. Naval commanders protested the order, for it went far beyond even the previous agreements by which the Commander-in-Chief, Air, had gained almost complete control of naval air. If this bold effort to exercise even direct operational control over naval air units assigned to the Navy was successful, naval aviation would suffer a further loss. And there wasn't much more left to lose.

Almost as soon as the dispute developed, it was announced that the question would be settled by the OKW. A few hours later it was directed that the order of the Air Force Commander would be obeyed. Who made that decision? General Jodl, Chief of the Operations division of the OKW, and Hitler's close assistant, a career general staff officer imbued with the continental philosophy of war. So, again, the Navy lost an important issue. It lost because the very nature of the supreme general staff was such that even the Commander-in-Chief of the Navy was so hopelessly submerged in the system that, when he protested against the arrogant encroachment of those who sought to destroy a vital element of naval power, he could appeal only to the friends of this antagonist. Neither did a direct appeal to Hitler, the supreme commander, offer a solution to Raeder's dilemma. When Raeder felt compelled to take his case to Hitler, the request for such a conference was addressed to Jodl. It is readily understandable, then, why Raeder was never overly successful in getting Hitler to overrule a decision made by Jodl, his representative on the supreme general staff.

By February, 1941, the erosion process to which naval aviation had been subjected had progressed to the point where Raeder, as if in desperation, again carried his case to

Hitler, protesting against further continued incursions into naval matters by the Air Force. This latest effort to protect the remnants of naval aviation played directly into the hands of the anti-naval elements of the OKW. By forcing the issue with a conference with Hitler, Raeder opened the way for the issuance of a directive for settlement of the dispute. The directive was issued, but it was not the kind of a settlement hoped for by the naval authorities. Again, Jodl facilitated the achievement of the Air Force objectives. The directive that was issued not only settled the points in question but it also sealed the fate of naval aviation. Jodl, brought up in the landminded atmosphere of the general staff, and never understanding the true meaning of sea power nor the principles of its application, was, because of his position within the German national general staff (OKW), able to play a decisive role in the achievement of the Air Force goal of a single air force through the destruction of the naval air arm. Jodl personally assisted in the drafting of the directive.

From the beginning of the struggle over naval aviation Raeder never had a chance. Whatever arguments there were between the air and ground elements of the OKW were forgotten when the question of naval aviation arose. The Air Force wanted to achieve a single air force, something that could be accomplished only through the destruction of naval air. Ground representatives didn't understand sea power and could not see the need for the Navy possessing its own naval air elements. Besides, did not the very concept of a supreme general staff have as its corollary a single air force? Thus, the practical result was that as far as naval aviation was concerned, the air and the ground forces within the OKW forgot their differences and made common cause against the Navy's air arm. Consequently, Raeder was in as tight a box as ever a man found himself. This supreme general staff that frustrated and smothered his every effort to protect German naval aviation was more than an ordinary box; it was the coffin of German sea power.

But the story of the sad fate of German naval aviation serves a purpose beyond showing that a naval arm with its own air elements cannot exist under a national gen-

eral staff. It pointedly illustrates that under a single general staff and a single air force there can be no naval aviation in the sense that naval men understand it and use it. The very same lack of comprehension that prompts its involuntary inclusion into a single air force results in its ultimate extermination.

Because strong naval power is unattainable unless it includes a necessarily powerful naval air arm, the annihilation of German naval aviation at the hands of the Nazi national general staff amounted to much more than an interservice squabble. In effect it represented a failure to exploit German sea power to the maximum at the very time when British survival hinged on adequate sea communications. Viewed from the Allied standpoint, the intrastaff vendetta against the air arm of the German Navy was a fortunate development, for had a strong naval air element been available to supplement the U-boat effort it is possible, as has been claimed, that such naval air assistance would have resulted in unbearable Allied shipping losses. Whether it would have turned the tide may be conjectural, but it is hardly debatable that an effective German naval air arm would have forced the battle of the North Atlantic to a much closer decision.

So while rejoicing in the realization that the German supreme staff system brought about the destruction of its own Navy's aviation, thus sparing the Allies the tough and added burden of doing so themselves, we must realize that adoption of such a staff system in this country would unquestionably result in bringing about in time of war the same beneficial results for our nation's enemies.

However significant the fate of naval air under the OKW, the destruction of German naval aviation represented only one aspect of German failure to understand the capabilities of sea power and to apply it knowingly. From the Baltic to the Black Sea German naval capabilities were largely disregarded by the National General Staff that directed the Axis war effort. In no instance was sea power utilized properly to assist the prosecution of land campaigns. The German Air Force, as if taking a page from Douhet

and Mitchell, and believing in its own invincibility, continued to be guided and enthralled by the false air power creed that relegated Mahan's philosophy of sea power to the ash can of history. The Army General Staff, which continued to dominate the OKW, was steeped in the traditions of the Great General Staff and, like it, was land-minded to an extreme. So, within the confines of the all-powerful OKW it was as if sea power was a thing anathematized.

Here, briefly, are but a few examples of how the OKW, the national general staff, failed to use available naval power to facilitate a major campaign.

In Norwegian operations as well as the campaigns against Holland, Belgium, and France, Nazi planning was characterized by a chronic failure to employ available naval strength to cooperate with and assist the land effort. The German High Command thought in terms of land power, and consequently it misused sea power.

On the basis of high German naval opinion it is not illogical to speculate but that the German failure to understand and use naval power contributed to the success of the British escape at Dunkirk; and—what is of possibly more significance in this study—such German failure to use the sea deprived the land forces of a complete victory. The long range result of this error by the supreme staff was in no way favorable to the Nazi war effort.

After Dunkirk England was at the mercy of the Nazi might. All that was needed was the final attack across the English Channel. But, the German supreme general staff, while fixing its gaze on the island objective, overlooked the narrow strip of water separating the Continent from Dover's chalk cliffs. This, incidentally, was the same mistake made more than a century before by Napoleon, another advocate of the single general staff system. None of the many examples of German staff ignorance of sea power is more pointed than that provided by the long planned, highly touted, but never executed "Operation Sea Lion," the proposed cross-channel assault.

Never has there been a better example of how a national general staff, its thinking geared to problems of landmass warfare as

was the German OKW, is utterly lost when confronted with the problem of conducting a major amphibious operation. Such ignorance of major overwater assault principles stemmed directly from the German Army's long preoccupation with the problems of land warfare. Like the armies of other nations between the last great wars, the German Army never evidenced more than a vague academic interest in amphibious matters. Blissfully it went along in the years before World War II considering amphibious operations much as a wide river crossing. Consequently, when the OKW turned to the task of planning for "Sea Lion" it found itself without any amphibious doctrine. Indeed it is pertinent to observe that the only nation that had an adequate amphibious doctrine at the outbreak of the war was the United States, where there was no national general staff to prevent full realization of the meaning of sea power nor to stifle its development.

German staff planning for the projected landing against England was characterized by an almost unbelievable ignorance of the most basic naval knowledge. Original plans prescribed a landing force of 40 divisions. However, as soon as the planning agencies, which in this case were not naval, were informed of the amphibious facts of life by the highly distraught Navy officials, the figure was scaled reluctantly to a mere 13 divisions. The utter ludicrousness of even this latter figure is readily seen when it is realized that it was not until late in the war that the U. S. Navy was able to embark landing forces of even half a dozen divisions. And, by the farthest stretch of fancy, available German shipping could not come close to carrying a fraction of the scaled-down figure of 13 divisions.

Napoleon once observed, "Masters of the Channel for six hours and we are masters of the world." Neither Napoleon's France nor Hitler's Germany could achieve channel mastery for those six precious hours. High among the reasons for such failure is the fact that the armed forces of both were directed by a national general staff, dominated by a land power philosophy that precluded the understanding and proper use of sea power.

In the Mediterranean theater there was

abundant opportunity to utilize Axis sea-power to assist the land campaigns. But, here again, the OKW failed to comprehend what was meant by gaining strength on land through domination of the water areas. Both Italian and German naval authorities claim that Malta could have been seized early in the war. Axis seizure of Malta would have conceivably set off a chain reaction of events, all unfavorable to the Allies.

It is not our purpose to attempt to determine whether or not the Axis could have seized Malta in 1939-40. What is important is this: despite the great advantages to be gained from such action it appears, on the basis of available information, that the OKW never seriously considered or prepared even a tentative Mediterranean campaign plan based on seizure of Malta and the control of Mediterranean waters. Of added significance is the fact that a naval representative actually presented top staff officers a concept for such a campaign in the Mediterranean based upon exploitation of sea power. It was curtly rejected and the plans went no further. Again the landmindedness of the OKW precluded, to the probable detriment of the German war effort, the exploitation of the sea for the purpose of assisting the battles on land.

The Russian campaign is generally viewed as exclusively a land struggle. At least such was the view of the landminded staff that prepared the plans for the Russian campaign. German effort against the left (north) flank suffered from a failure to apply naval power, principally in the form of landings in rear of Russian concentrations, to assist the land offensive.

On the southern extremity of the Russian battle line was the Black Sea. To the German armies striking for the rich oil lands beyond its eastern littoral that body of water proved to be a major obstacle necessitating a long, laborious campaign around its shore. To the landminded OKW the Black Sea appeared an obstacle, and so it was permitted to be just that. Yet to those who understood sea power the Black Sea lay like a shorter and safer route to the coveted oil fields. Therefore, the objective, instead of being to get around the Black Sea, should have been, obviously, to control it in order to use its



Official U. S. Marine Corps Photograph

AMPHIBIOUS WARFARE, VICTORIOUS WEAPON OF WORLD WAR II

Untrammelled by single-service concepts, the planners of U. S. Military operations in World War II coordinated the efforts of land, air, and sea power.

direct sea lanes, free from the constant threat of Russian land power. The feasibility of such a plan is attested to by high German naval authority, which pointedly contends that a determined air and naval offensive would have reduced the Red Navy units in those waters. This, combined with airborne and amphibious attacks against Russian harbor facilities, would have resulted in German domination of the Black Sea, which in turn would have permitted economical water transport of men and material down the Danube and across the Black Sea to the vital Baku area.

In this, as in all other instances where the sea exerted an influence on German military operations, the OKW failed to realize the relationship of sea power to the land cam-

paigns. Land power concepts of road and railroad rearward communications prevailed even in this southeastern theater dominated by the Black Sea. Because the military leaders of Germany were by tradition trained to think in terms of land warfare, the campaign in the Black sea area was conducted in accordance with the continental concept of war, and consequently, it remained estranged from the sea.

When the fate of German naval aviation is considered along with the Nazi national general staff's failure to understand and use sea power, we can understand why British Air Vice-Marshal Kingston-McCloughry has stated in his study of high command methods: "The OKW is generally regarded as having been one of the most important

factors leading to Germany's defeat."

Yet, in their failure to exploit the Black Sea the Germans were not alone. Russian effort in those waters was largely characterized by the same disinclination to conduct aggressive sea operations with the forces available. The passiveness of the Russian Black Sea Fleet resulted in a failure to exploit Red sea power against the limited German coastal shipping and land positions. This deficiency, of course, was but the reflection of the fact that the Russian armed forces, like the German, were directed by a supreme general staff.

Landmindedness in the direction of the Russian war effort was assured by the fact that the Red Army General Staff was, for all practical purposes, *the* general staff of all the armed forces. The important point of all this is that the misunderstanding and misuse of sea power was a deficiency common to both the German and Russian conduct of the war. Both utilized a supreme general staff system for the direction of their armed forces. Both supreme general staffs were dominated by their ground force general staffs. Consequently the traditional continental landminded concept of warfare prevailed in the conduct of the Russian as well as the German war effort. National general staffs of enemy powers clearly manifested the same characteristics. This most certainly should emphasize the fact that German landmindedness and ignorance of sea power was not peculiar to that nation. In Germany, as in Russia, it was inherent in the system of the national general staff.

The example of the United States contrasts sharply with that of those countries having a national general staff system and which as a result failed to understand sea power. In the U. S. Congress has repeatedly rejected the national general staff concept. Instead of a supreme staff system, incapable of concurrently understanding and applying land, sea, and air power, this country utilizes our Joint Chiefs of Staff system.

One of the principal differences between the continental supreme general staffs and our Joint Chiefs of Staff is that under the U. S. concept no one service should be dominated by the others. Decisions, until recently, were reached on the basis of una-

nimity. In this respect it is probably impossible for the continental military mind to believe that we have achieved such effective military power without vesting final power of decision in one military commander or chief of staff; but such is the evidence of history. Those who contend that deliberative agencies, such as the Joint Chiefs of Staff, are incapable of making decisions overlook the very important fact that during the entire war there were not over "five or six" questions that could not be resolved unanimously by the Joint Chiefs.

The absence of a National General staff in the United States has had a beneficial influence on our National Security. For instance, a supreme staff system could well have meant the end of effective naval aviation at the very time when that element of our naval power was undergoing one of its most important periods of development. In 1936 an interservice controversy arose over whether U. S. warplanes should be liquid cooled or air cooled. The spokesmen for Naval Aviation defended the air cooled motor and insisted on its continued use and development for naval purposes. The Navy refused to yield on this point. There was no single chief of staff and so there was no military authority possessing the power to direct the Navy to change from air cooled to liquid cooled engines. So Naval Aviation continued to concentrate on such power plants, which, incidentally, powered 85 percent of all U. S. (not just naval) aircraft in the last war.

How different could have been the result of this controversy had our armed forces been under a national general staff system. A single chief of staff would have had the authority to make an "administrative" decision that would have not only retarded the advance of the Navy's air arm, but, as things eventually worked out, it would have detrimentally affected the growth of air power in this country. It might be well to remember, in connection with this incident, that when the Navy's air cooled engine policy was attacked, the Navy went right ahead making and improving the air cooled engines; in a somewhat similar controversy the German Navy, handicapped by the national general staff, was not even per-

mitted the necessary fittings to handle aerial torpedoes!

The Marine Corps, as developed in the United States, is a unique and major feature of our national sea power. Integration of adequate Marine landing forces into naval organization, a policy pursued by U. S. Naval leaders since the Spanish American War, has resulted in the achievement of a form of naval power found in no other modern nation's armed forces. Adherence to a policy of developing Marine fleet landing forces resulted, quite understandably, in the progressive development of a farsighted and fundamentally sound doctrine for the conduct of major amphibious operations. The efficacy of such naval policy manifested its worth in World War II, when prosecution of decisive offensive action against the Axis powers was largely dependent upon the ability to conduct amphibious operations. It is one of the ineludable facts of history that without the benefit of amphibious know-how, produced by the Marine Corps and Navy, Allied plans for carrying the battle to the enemy would have been shackled by the same ignorance of amphibious doctrine that doomed the Nazi "Operation Sea Lion" from the minute that the need for a cross-channel assault was perceived.

A national general staff in this country during the first half of the 20th century would quite probably have prevented the creation of strong fleet landing forces, and, because the existence of such naval agencies are a prerequisite to the continued development of landing doctrine, the light of amphibious knowledge that lit the way to victory in World War II would have been snuffed out while being kindled.

It takes but a brief recollection of the attacks leveled against the Marine Corps and its mission during the early 1930's to realize how certain would have been its fate under a national general staff. The certainty that Fleet Marine Forces would have been eliminated as a major element of naval power is all the more heavily underlined by the persistence of attacks against the Marine Corps. Even during and after World War II, in which the wisdom of our nation's amphibious naval policy was so repeatedly

and forcefully demonstrated, our naval power would have been in grave danger of being shorn of its Marine landing forces had a national general staff system been in effect in this country.

And this is no mere speculation. It is a matter of official documentary record that over a prolonged period the Chief of Naval Operations was the only chief-of-service member of the Joint Chiefs of Staff who favored continuation of the Marine Corps in the form and for the purpose for which it had developed as an agency of naval power. While there was a failure by some elements of the armed services to understand the need for fleet Marine Forces, there was fortunately no Chief of Staff with the power to eliminate the Marines as amphibious specialists. Thus the naval service has retained its Fleet Marine Forces, and, as the history of the past decade clearly shows, our national security has been accordingly enhanced. Again, how different would have been the course of the late war if, for instance, a single chief of staff had decided sometime in the early 1930's that the Navy did not need Fleet Marine Forces!

Nor is it logical to contend that balanced naval power would survive under a national general staff system established in the future. In view of the long standing lack of comprehension manifested by non-naval elements of the armed forces with respect to the need for Fleet Marine Forces and strong naval aviation, the fate of the U. S. naval power under a national general staff of today or tomorrow would be just the same and just as certain as it would have been under a national general staff any time in the past half century.

Fundamental philosophies of military power do not change in a day nor in a generation. For instance, soon after the First World War it was charged that the capital ship was obsolete. After World War II the need for any navy at all was publicly questioned at the highest military level. The persistency of such anti-naval thinking is illustrated by the fact that, despite the intervening years, both of these attacks on naval power originated from within the same service. The attitude on the part of another element of the services against maintenance

of a strong Marine Corps has been equally persistent and vigorous.

Thus, in this country we have a background of anti-naval ideology within the services frighteningly similar to that existing in Germany when the OKW made possible the destruction of German naval power. The parallel is clear. The results under a national general staff would be the same.

All of which brings up another vital aspect of the case against a national general staff. Although there is no question but that our national sea power would suffer under such a system, the issues go far beyond strictly naval matters. In the final analysis, it is not simply a question of a national general staff bringing about the destruction of our naval power *per se*. What is of even more fundamental significance is that the existence of a national general staff would pose a threat to understanding and use of not only sea power, but air and land power as well. While land power has dominated national general staffs in the past, it is possible that under temporary and exceptional circumstances extreme air or even sea power advocates might dominate such a supreme staff. Air or sea power pre-eminence within a supreme general staff conceivably could result from astute placing of personnel at the "working levels" of the system, or through influencing the selection of the person appointed to the position of chief of the national general staff. Since one philosophy of power would at any given time dominate the thinking and actions of a national general staff, it is evident that the elements of the armed forces not represented by the then existing dominant thought would be in constant danger of being misunderstood and misused.

Such an eventuality could well have fatal results in this country, for the security of the United States, as compared with that of other major powers, is peculiarly dependent upon strong land, sea, and air forces. Action detrimental to any of these elements of national security would have a serious effect upon U. S. safety.

On the national strategic level, as distinguished from theater of operations levels, our security depends not, as has been erroneously claimed, on immediate decisions regardless of whether or not they are right,

but rather upon the correctness of decisions. A national general staff headed by a chief of staff certainly will be capable of giving a quick decision. On the basis of performance in other countries it can be said categorically that such decisions, when they affect more than one service, will be wrong a large portion of the time.

This in turn points up the misconceptions of national general staff advocates who claim that unified theater or operational command systems must have their counterpart at the seat of the government. Such an argument fails to recognize the very fundamental differences between the functions of command at the theater and operational levels as compared with that at the governmental level. Command at the seat of government renders only the broadest strategic decisions, which in turn determine what the commanders at the lower levels will be directed to execute. Such decisions, involving the nature of forces to be maintained by the nation as well as when and under what circumstances the various elements of the national armed forces are to be used, must be based upon the requirements of global strategy. As the history of modern war has so clearly established, error in high level strategy, once made, can be seldom rectified.

That is why decisions at the seat of government must be based upon correctness rather than alacrity. When one element of the armed forces dominates the agency for evolving such decisions, there is the ever-present probability of making a potentially fatal strategic error. Only when the chiefs of the land, sea, and air forces are able to present their views on the highest military level as partners is the possibility of misuse of one of the services adequately guarded against. The partnership in protecting national security, so deliberately established under our Joint Chiefs of Staff, would cease to exist under a national general staff. The chances for a serious strategic error would increase accordingly.

This particular aspect of the undesirability of a national general staff system headed by a single chief of staff is sharply reflected in the late Secretary Forrestal's observation that "the strategic decisions as to the conduct of global war are beyond the

capacity of any man, even when assisted by a brilliant and competent staff."

Under a national general staff the fate of a Marine Corps as developed in this country would be as certain as that of naval aviation. The concept of balanced naval forces is as incomprehensible to landpower minded advocates of a national general staff as it is to single air force extremists.

Without naval aviation and Fleet Marine Forces, naval power as developed in this country according to the concept of balanced forces would cease to exist. Our Navy would

be reduced to the kind of navy understood by national general staffs: cargo and combat vessels, and submarines—a navy that would be utterly incapable of fulfilling its mission. Because the United States will live or die according to its ability to control the seas, because a national general staff will inevitably destroy the means by which such control is effected, it is readily apparent why establishment of a national general staff would pose a vital threat not only to our sea power, but to our national security as well.



SUPER-REALISM

Contributed by LIEUTENANT COMMANDER H. B. SEIM, *U. S. Navy*

An air of expectancy hung over the carrier task group as it charged toward the "hostile" coast during a recent joint exercise. But no one foresaw the surprise touch of realism which highlighted the operation. The group was preparing to launch a mock attack against Bermuda, repeating what our wartime task forces had done in earnest in their many strikes against the Japanese. "Enemy" heavy bombers were expected to oppose the raid and, as in the Pacific war, the ships were alerted, radars scanned the skies, combat air patrols maintained their vigil high over the carrier base. Finally the anticipated "bogies" loomed up on the screen and the fighters were vectored out for an intercept. When the bombers were still over fifty miles away, a press radioman dashed up to the bridge and handed the admiral a news item just received on a commercial press circuit. Glancing over the dispatch, the admiral smiled, then read it to the bridge watch:

"Sixty superfortresses, defending Bermuda against a mock attack by a United States Navy task force, intercepted and 'bombed' the surface raiders 400 miles from their goal today in a test of United States sea and air power. . . ."

INSIDE JOB

Contributed by MR. CECIL P. LEWIS

Non-commissioned officers have long been acclaimed the backbone of the Marine Corps, and tales are often told of their ability to cope with nearly any situation. However, there is at least one example in which a sergeant was left completely nonplussed.

The noncom had been having trouble in getting his squad out for reveille in the morning, and so one sunrise as the bugle blew, he made the rounds, shouting at late risers and laggards. He came upon the bunk of a private first class who was comfortably dug in beneath his blankets and apparently had made no attempt to rise.

"Get out of that sack!" the sergeant roared, glaring down. "That bunk has to be made up before you fall out for roll call!"

"I'm starting on it, Sarg," was the PFC's sweet reply from beneath his sheets. "I'm making it from the inside here and working out."

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS.)



Official U. S. Navy Photograph

PEARL HARBOR, DECEMBER 7, 1941

Author of the Pearl Harbor attack, Admiral Yamamoto was pessimistic of ultimate victory.

ADMIRAL YAMAMOTO

By JAMES A. FIELD, Jr.

November, 1941, not one American in a thousand had ever heard of Admiral Isoroku Yamamoto, Commander in Chief of the Japanese Combined Fleet. A month later his name was on every lip. For the enemy, not even for Hitler, did Americans hold such a bitter hatred. Yamamoto was the man who had planned the heroic blow at Pearl Harbor. And as words were not enough, he had added insult to injury by boasting that he planned to bring peace to the White House. To all Americans he was the embodiment of the scoundrel. To all Americans he was a peculiar personal foe.

Historian's investigation and the recovery of some of Yamamoto's letters have considerably changed the picture. Appearance and personality were very different. In large measure the hatred was undeserved. Behind the surface of Japanese politics and of wartime publicity there lay tragedy—the tragedy of a man who had to fight a war he did not want, a war he knew he could not win.

But the popular view was hardly surprising. The shock of Pearl Harbor was immense, as great as it did to a nation that had long safely sheltered behind the oceans of the world and also, perhaps more important, sheltered behind the oceans of the mind. The shock was immense, but shock was not all that caused the hatred. There was also ignorance.

The American public had never known much about Japan, and even less about individual Japanese. With the outbreak of the war, the journalists hastened to fill this gap and enlighten the people regarding the nature of the Japanese enemy. But so scanty was the material available in this country that the best efforts were not wholly successful. Inevitably the results were over-simplified, telling more about the emotions of Americans than the character of the Japanese. Such was the case with the picture of Yamamoto that was presented to American readers.

Yamamoto, the story went, had grown up among the fisher folk of northwestern Japan where the choice of a career was restricted to either becoming a fisherman or joining the Navy. That he made the latter choice was attributed to the burning hatred of the United States instilled in him by his family. As a child, so it was reported, he had heard from his father tales of the barbarians "who had come in their black ships, broken down the doors of Japan, threatened the Son of Heaven, trampled upon the ancient customs, demanded indemnities, blown their long noses on cloths which they then put in their pockets instead of throwing away." From his earliest years, it was said, the main motivation of Yamamoto's life was this hatred of America, and it was the desire "to return the visit of Commodore Perry" that drove him forward in his naval career.

The physical appearance of this vengeful being as described for the American public was not flattering, even after allowance for differences between western and oriental standards. He had "hair cropped as short as the bristles on a beaver-tail cactus, lips thick, jowl heavy, chin prominent." His character matched his looks: he was "surly and abrupt . . . a man of tremendous conceit." Tribute was indeed paid to his abilities: his appreciation of naval aviation, his arguments for increased carrier strength, his emphasis on the value of the aircraft torpedo were all recognized. But above all else

EDUCATED at Harvard University and Trinity College, Cambridge University, James A. Field, Jr., saw active duty in the U. S. Naval Reserve from February, 1942, through August, 1946. Attaining the rank of lieutenant commander, he served as gunnery officer of CarDiv 26 and subsequently as a member of the Naval Analysis Division of the U. S. Strategic Bombing Survey. Now a member of the Department of History at Swarthmore College, Mr. Field is best known to Service personnel as the author of *The Japanese at Leyte Gulf*.

emphasis was placed on the motivating hatred. Yamamoto was a man "of murderous stripe . . . intense nationalism and hatred of foreigners"; he had conceived the blow at the U. S. Pacific Fleet "and its officers and men, whom he hated"; he was "the most rabid advocate of war against us." This standard accepted view of the Japanese naval commander is well summarized in a quotation from an article written after the war by the American Army pilot who shot him down:

Yamamoto had been, from childhood, a hater of all things American. He had lived every hour of his vengeful life, even as *attaché* in Washington, in anticipation of the moment when he would lay down in that city the Emperor's dictates for American bondage.

A conceited and arrogant man, Yamamoto, with a face like a frog but with a calculating mind that functioned precisely. An evil man with a personal calendar for the conquest of Asia and America.

The treacherous attack on Pearl Harbor was his opening gun in that campaign. An easy man to hate, Yamamoto, and one that it would be an honor to destroy.

Wartime information is, of course, always to be taken with some salt. This is particularly true of information originating in the feverish days of a beginning war, and the portrait of Yamamoto that took shape in early 1942 is no exception to this rule. So little real information was known that the result was an abstraction, a picture drawn to fit the times and based on two things: the treacherous attack on Pearl Harbor and the famous boast about dictating peace in the White House.

The story of the boast begins with a Domei broadcast intended for Japanese consumption which, intercepted by American monitors, reached the press ten days after Pearl Harbor. The text of the broadcast was as follows:

The strategy of surprise which was carried out by Admiral Isoroku Yamamoto, Commander in Chief of the Japanese Combined Fleet, with such success, was planned by him earlier, according to the *Yomiuri* [a Tokyo newspaper].

The *Yomiuri* published a letter which Yamamoto sent to a close friend, dated January 24 this year [1941.] Therein Yamamoto made this statement:

"Any time war breaks out between Japan and the United States I shall not be content merely to capture Guam and the Philippines and to occupy Hawaii and San Francisco.

"I am looking forward to dictating peace to the United States at the White House in Washington."

This broadcast was a hoax. It was believed implicitly, it still is believed in this country. More important, it was believed by the Japanese. But it was a hoax perpetrated with the single purpose of stimulating the spirit and the confidence of a Japanese public shaken by the stunning news of the outbreak of war with America.

Yamamoto had indeed written a letter, but it was a letter with quite a different meaning. He had written it not "to a close friend" but to an acquaintance, Ryoichi Sasakawa, leader of the ultra-nationalist All-Japan Labor Class Federation. By or with the connivance of the recipient, the Admiral's words were twisted from their original meaning and then given to his countrymen by the state-controlled press. His reaction to this betrayal of trust is not recorded. It may perhaps be imagined from a comparison of the broadcast with the correct text of the letter.

24 January [1941]

Dear Sir,

I trust that you are in the best of health. I deeply appreciate the trip of inspection you made to the South Seas on the *Uranami*. In this age when armchair arguments are being glibly banded about in the name of state politics, your sober attitude in going to so much trouble to be loyal to your own opinion is to be most highly commended. But it embarrasses me not a little to hear you say that you "feel at ease in the knowledge that Yamamoto is out at sea with his fleet." All that I am doing is to devote my utmost, both day and night, toward building up our strength, ever bearing in mind the Imperial admonition:

"Despise not an enemy because he is weak;
"Fear him not because he is strong."

I am counting only on the loyalty of the one hundred thousand officers and men who are going about their duties in silence and without boasting.

Should hostilities once break out between Japan and the United States, it is not enough that we take Guam and the Philippines, nor even Hawaii and San Francisco. We would have to march into Washington and sign the treaty in the

White House. I wonder if our politicians (who speak so lightly of a Japanese-American war) have confidence as to the outcome and are prepared to make the necessary sacrifices?

With best wishes for your good health,
Respectfully yours,
Isoroku Yamamoto.

There is no boasting here. In no sense expressing belief in his ability to dictate peace in the White House, Admiral Yamamoto was addressing a warning to the sword rattlers. He was pointing out that war with America was not as simple a matter as Sasakawa and his colleagues might think, that it is easier to start a war than to finish one, that it is necessary to see one's way through to the end before entering on a major conflict. In its essence the letter was an anti-war plea, for Yamamoto was well aware that there would be little chance for his country in a prolonged conflict with the immeasurably more powerful United States. The letter shows the Admiral as the realist attempting to save his country from encompassing its own destruction.

Far from being sanguine of victory, far from expecting to lay down terms in the White House, Admiral Yamamoto entered the war with a feeling of tragedy and the anticipation of defeat. These premonitions he naturally kept largely to himself, but whispers did get around. After the war Admiral Soemu Toyoda, the last Commander in Chief, stated that he had heard his distinguished predecessor quoted during the early days of the conflict as feeling that "we can carry through for one year some way, but after that I do not know."

II

Isoroku Yamamoto had had a distinguished naval career. He had entered the Naval Academy at Eta Jima in 1901, at the age of seventeen. In May, 1905, while still a midshipman, he was slightly wounded while serving aboard the *Mikasa*, Admiral Togo's flagship, at the battle of Tsushima where the Japanese annihilated the Russian fleet. Commissioned in August of that year, he began his advance through the various grades and for a number of years followed the conventional career of a junior officer, his

duties alternating between service afloat and staff and instructional posts ashore. In 1919 he was stationed briefly in America, and from 1925 to 1927 he served as *naval attaché* in Washington, an assignment which afforded him opportunity to inform himself regarding the nature, power, and policies of the United States.

Throughout most of the world the twenties were a period of profound peace. Military problems were forgotten and armies and navies stagnated for lack of funds. But in Japan, where powerful groups looked covetously across the narrow seas towards China, the services did not atrophy. Yamamoto was early marked out for high command, and his great abilities were not restricted by lack of opportunity. Promotion came with unusual rapidity and in 1923, at the age of 39, he became a captain.

From this time on Yamamoto's duties centered principally in the expanding aviation branch of the Navy and in the General Staff. His first command came in 1928 when he was given the light cruiser *Isuzu* for four months, subsequently being transferred to the *Akagi*, one of the earliest and largest of Japanese aircraft carriers, later to be lost at the Battle of Midway.

Important matters of policy were early confided to his attention. The staffs to which he was assigned were always major ones and his duties always demanding. At no time was he left to cool his heels in second-rate jobs. Promoted to Rear Admiral in 1929, he accompanied the Japanese delegation to the London Naval Conference of that year. Returning from London, he was assigned to duty at Naval Aviation Headquarters. This was followed by eight months at sea as Commander Carrier Division 1, working out the practical problems involved in the developing theories of air warfare. On the completion of this assignment, Yamamoto returned to the General Staff for briefing prior to his departure as Japanese delegate to the London Naval Conference of 1934. While attending this conference he was promoted to Vice Admiral, and upon his return to Japan became Chief of Naval Aviation and Vice Minister of the Navy as well. Here he remained until August 30, 1939, when, the Nazi-Soviet Pact having ensured the Second

World War, he was shifted to chief command at sea.

Despite his previous service in Washington, the occasion of the 1934 conference was the first time that Admiral Yamamoto appeared at all prominently in the American public eye. He had chosen to proceed to London by way of Vancouver and New York, and his progress across the North American continent was daily reported in the press.

Not only was he the conference delegate of the third greatest naval power. His presence in the United States took on added interest as a result of testimony then being given a congressional committee by another aviation specialist, General William Mitchell. Mitchell, agitating for greater air strength, was filling headlines with dramatic statements of inevitable war with Japan, and urging that our aviation establishment be designed specifically for such a conflict.

Although he had succeeded in dodging reporters during his transcontinental journey, Yamamoto was finally cornered for an interview in his hotel in New York. Asked to comment on the Mitchell testimony, the Admiral mildly remarked: "I do not look upon the relations between the United States and Japan from the same angle as General Mitchell, and I have never looked upon the United States as a potential enemy. The naval plans of Japan have never included the possibility of an American-Japanese war." And having thus delivered himself, he boarded the *Berengaria* and sailed for England.

The London Conference of 1934, the last attempt to limit naval forces by treaty, was a failure. Attempts at agreement broke down largely because of Yamamoto, who firmly rejected, on behalf of Japan, any extension of the 5:5:3 ratio principle and demanded national self-determination of armaments as a sovereign right. This stand he defended by a dinner-party witticism which gained some attention, pointing out to his hosts that although he was smaller than they, he was not asked to eat only three-fifths as much.

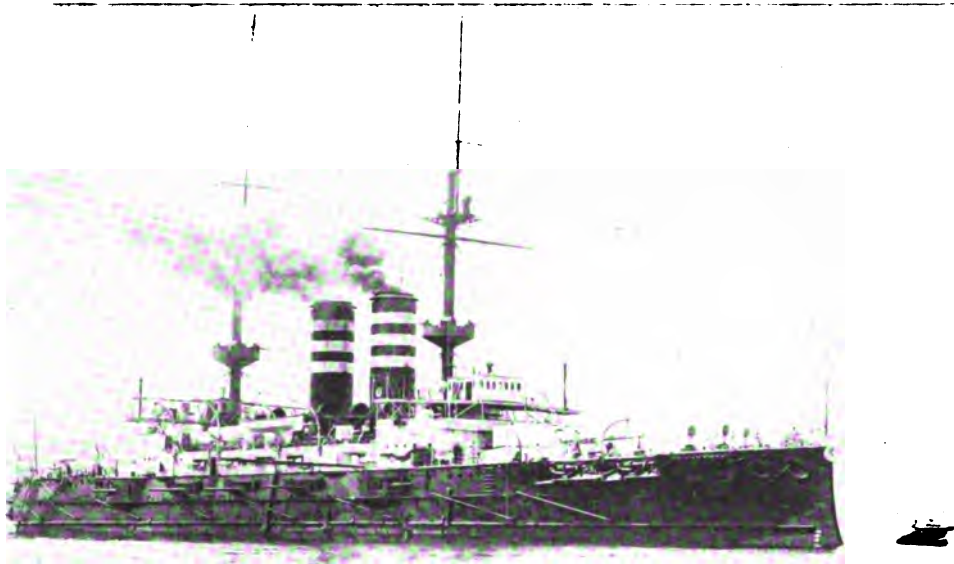
Such a defense was not good enough. Both America and Britain attacked the Japanese proposal as one for equality of armaments rather than equality of security. It had no chance of acceptance but it did

prevent agreement, and although the talks dragged on for another two months nothing was accomplished. Yamamoto at one point stole the headlines with a spectacular proposal for the abolition of all capital ships and aircraft carriers. When asked how, if this were done, the United States and Great Britain could defend their possessions in the Far East, he pleasantly replied, "The only defense they need is justice and international friendship."

It is not hard to see some signs here that the Admiral had his tongue in his cheek. But without going deeply into the motives and policies of Yamamoto and of the Japanese Government, one can at least say that if the Admiral burned with hatred for the western powers he kept it well under control. He had taken pains to smooth over General Mitchell's belligerent testimony. While his remark that Japan's plans had never contemplated war with America seems somewhat naive, the trouble may be in the translation. Addition of the qualifying adjective "offensive," or the use of the verb "desired" would bring the statement well within the realm of military common sense. Finally it is noteworthy that in conversations with newspapermen following his return to Japan, Yamamoto was careful not to blame any particular country for the failure at London—this although the Americans in particular and the British only to a lesser extent were vigorously blaming the Japanese.

After the London Conference Yamamoto disappeared from the American press for a period of three years. His next appearance was a result of the bombing of the gunboat *Panay* by Japanese aircraft, and once again he was busy pouring oil on troubled waters. In December, 1937, he issued a statement, as Vice Minister of the Navy, thanking the United States government for its acceptance of Japanese apologies and pledging his service to more careful conduct in the future. "That the incident has been solved despite distorted reports and propaganda," he said, "is due mainly to the fair judgement of the American government and people."

Here again, on the surface at least, there is no evidence that he was governed by a hatred of the United States or of the western world. He was, of course, a Japanese, and his



Official U. S. Navy Photograph

FLAGSHIP OF VICTORY AT TSUSHIMA

As a midshipman Yamamoto participated in the crushing defeat of the Russian fleet, but did not live to see the even more crushing defeat of the Japanese Navy in World War II.

first loyalty was to Japan. Undeniably, Japan was embarked on a program of military conquest in Asia, and Yamamoto was one of her senior naval officers. He was not, we may presume, a pacifist. But for anyone who aspired to return Perry's visit, the first consideration was clearly the military problem, and to anyone who could see it all plainly, the problem was insoluble. Japan just did not have the necessary strength.

Furthermore, naval officers do not usually obtain rapid promotion because of their emotional attitudes toward foreign countries. They gain it, generally speaking, because of professional competence, and Yamamoto, far from being an exception, is a particularly good example of this rule. Already Japan was advancing in China and the Japanese Navy was building in secret the most powerful battleships in the world. But for the ultimate success of the expansionist program one thing above all was essential: to avoid, or at the very least to delay, war with the United States.

All the evidence goes to show that Yamamoto realized this, that he adopted this view, and that he attempted to further it as a policy. In common with other senior naval officers, and in opposition to the Kwantung Army clique, he steadfastly opposed linking Japan to the fortunes of the European Axis. Among his subordinates the belief was general that he had fought vigorously against the 1940 signing of the Tripartite Pact, the diplomatic step which, in the last analysis, sealed the fate of Japan.

III

Through the years Yamamoto's reputation within his own country grew steadily, both within and without the military services, until by 1941 he was regarded almost with veneration. Whatever he said was apparently accepted without question by his colleagues. His word was law. Many things were attributed to him with which he had manifestly no connection: for example, after the war certain admirals credited him with

the development of the Kamikaze Corps despite the fact that by the time of its inception Yamamoto was long dead. A sufficient indication of the value placed on his name by groups outside the Navy is seen in the perversion of the "Peace in the White House" letter. But this extreme respect does nothing to make an accurate judgement easier. Almost as much as the hatred entertained in America, it complicates the problem of cutting through the myths to the man himself, his character and his military contributions.

Even at a cautious estimate, however, his military contributions seem very considerable. In the years of peace Yamamoto's emphasis on aircraft and on aircraft carriers, both in the Japanese building program and in his proposal—possibly serious—at London for their abolition, showed real foresight regarding the future of naval warfare. His emphasis on the aircraft torpedo was to prove wholly justified. In tactics, Yamamoto's development of the massed use of carriers, the carrier task force with which he began the war and with which the United States ended it, showed a remarkable power of analysis and constructive imagination. Within the limits set by Japan's industrial strength, the Japanese Navy was well prepared for the kind of war it was to fight. The rapid advance of the Japanese forces throughout the Western Pacific on the outbreak of war was certainly a feat of planning and execution of the very first class, notwithstanding the weakness of the opposition. What Yamamoto seized in four months took the United Nations more than three years to recapture. With these accomplishments, it would seem that his place in naval history is secure.

Nevertheless he made mistakes. Presumably no military leader ever avoids them. And it is only fair to note that the mistakes of the weaker and losing side always stand out more sharply than errors which are merely incidents on a march to victory. But of Yamamoto's errors, two of which are worthy of mention, one was decisive. This was the attack on Pearl Harbor for which he himself was largely responsible.

The Commander in Chief of the Combined Fleet was not in a position to decide funda-

mental policy. He did not rule on the question of how much risk should be taken of collision with the United States. His job was merely that of preparing to fight any war that might come. The decision to drive southward to seize the oil-rich Indies was not his decision, but by his narrow strategic approach to the problem of its execution he made inevitable the war that he had wished to avoid. Wiser than his Army opposite numbers in the political sphere, he was not wise enough. He had opposed the Tripartite Pact. He thought it necessary to strike the United States Fleet at Pearl.

One of his subordinates, with whom he worked closely and who survived the war, has quoted the Admiral as saying, early in 1941, that "if we have war with the United States, we will have no hope of winning unless the United States fleet in Hawaiian waters can be destroyed." To Yamamoto it seemed a foregone conclusion that a Japanese attempt to seize the Indies would inevitably mean war with America. Should such a drive be decided on it would therefore be necessary, as a precautionary measure, to secure the flank by the destruction of American naval power in the Pacific. The attempt to satisfy Japan's hunger for oil demanded in the name of strategy an attack on the strongest power in the world. Thus Yamamoto reasoned, and on this basis he laid his plans.

But from a broader view of the situation there was of course every reason for not bringing in America, more especially an America angry, bitter, and determined on revenge. The United States held no territory necessary to the completion of Japan's plans for southern expansion. The Philippines held no appreciable store of the strategically vital materials. They might easily have been contained while the tide of advance flowed past them. Even had America intervened, as Yamamoto expected, following attacks on British and Dutch possessions, it would have been a divided and disunited America, reluctantly entering a war which would certainly have been described in many quarters in most unflattering terms.

Seen from the planners' desks in Tokyo, however, the largest single factor in the Pacific situation was the American fleet. It

cast an even longer shadow than we thought. And it was fear of the fleet, coupled with an inadequate appreciation of the American domestic political situation, that led the Japanese to begin their war with this purely strategic stroke. The result was a brilliant raid, a notable military feat and an even more notable political error. Pearl Harbor was the decisive battle of the war, the battle that inevitably doomed the Axis powers.

In the long run Pearl Harbor was decisive. In the short run, in the sense that the Japanese had planned it, it was not. The U. S. carriers were at sea on that fatal morning, and the all-important base facilities survived the attack with little damage. For the United States it was a severe but not a mortal blow; for the Japanese it led directly to catastrophe. For now America was really in the war, and to Yamamoto, haunted by the disparity of industrial strengths, an early and complete naval victory was essential. This need led to the attempt to occupy Midway Island.

To have held and supported Midway for any length of time after seizure was a logistic impossibility. This fact was recognized, but it was hoped that the threat of its loss would be such as to bring the weakened American fleet to decisive action. The effort was disastrous. The failure of the Japanese Striking Force to scout to the eastward before committing its air strength to the attack on Midway resulted in the loss of four first-line carriers to American carrier-based dive bombers. This loss ended all Japanese hope of success. The basic plan had failed. Decisive action was no longer possible.

Two months later, when the Marines landed on Guadalcanal, Yamamoto fumbled again. He should have reacted vigorously and at once. Instead, he accepted the mistaken estimate of his landing force officer, Captain Yasuji Watanabe, who believed that only a few troops had been put ashore, that it was not a major American effort but merely a raid. Rather than striking with all his force, still at that time superior to what the United States could bring to bear, Yamamoto frittered it away in a series of bitter but indecisive night actions. This false estimate and the actions based upon it led to the long drawn out Solomons cam-

paign in which Japanese sea power was crippled by heavy losses in destroyer and air strength. The fleet was forced to withdraw to the Western Pacific, not to reappear until the American invasion of Saipan.

Yamamoto's handling of the Guadalcanal campaign was wrong, but the error was perhaps unimportant. Granting American determination, Japan could assume defeat. Already Yamamoto could see it staring him in the face. All chance of the decisive blow from which alone he might gain victory had been lost with the Japanese carriers at Midway. His forces were diminishing while those of his enemy were increasing daily. And time had now run out. The year which he had earlier estimated as the limit of successful action was now drawing to a close. He no longer had alternatives, the initiative had been lost, the situation was out of his control. All that remained, and he knew it, was a long losing fight.

IV

On May 21, 1943, a year and a half after Pearl Harbor, a Japanese broadcast reported that Admiral Isoroku Yamamoto, "while directing general strategy on the front line in April of this year, engaged in combat with the enemy and met gallant death in a war plane." FCC monitors who heard the broadcast reported that the Tokyo announcer seemed overcome with the weight of his news, and that toward the end of the communique his voice became choked, as if through tears.

In death, as in life, Yamamoto was used by the controlling Japanese Army clique to further its own ends. The same groups that had twisted his letter on the prospects of success against the United States now proceeded to exploit his memory. All the resources of propaganda were employed in the creation of a patriotic myth. He was awarded a state funeral, the second in Japanese history to have been given a naval officer, only Admiral Togo having previously been so honored. The arrival of his ashes in Tokyo was made the occasion of patriotic ceremonies for the rededication of the populace to the Greater East Asia War. On June 5, the ninth anniversary of the burial of Admiral Togo in the village cemetery at Tama,

Yamamoto was interred beside his illustrious predecessor. Five days later announcement was made that a funeral march, written in his memory, was to be published throughout Japan to remind the people of his deeds and to inspire them with his determination against the Anglo-Americans.

In the United States the report of his death resulted in considerable speculation as to how it had come about. April had been a quiet month in the Pacific, with no major combat activity in which such a death might logically have occurred. It was suggested in some quarters that he might have been killed in an airplane crash. Others thought that in view of increasing Allied successes, *hara-kiri* might prove to be the answer. Only with the end of the war did the truth become known: Yamamoto had been shot down by American aircraft while he was on an inspection trip to the northern Solomons. Radio intelligence had forewarned our forces of his schedule and an ambush had been laid for his plane, which was surprised and destroyed while approaching the Kahili airstrip.

But whatever the cause of Yamamoto's death, the fact was at once recognized as of the greatest benefit to the Allies. Shortly after the news became known an editorial in the *Nation* observed,

The death of Admiral Yamamoto removes America's most implacable foe among the small coterie of Japanese militarists responsible for the war. His boast that he would dictate the terms of peace at the White House was not that of an empty braggart. Yamamoto possessed great abilities. . . .

The dominant force in Yamamoto's life, according to those who knew him, was hatred of the white race, particularly of the United States and Britain.

And with the end of the war and publication of the facts on how he met his death, the *New York Times* remarked,

Yamamoto would surely have ranked high on General MacArthur's list of war criminals. Pearl Harbor was his special and particular crime. . . .

Three years dead, he is well worth our study today. Admiral Yamamoto was a link between the old Japan of the Shoguns and the new Japan which set out to conquer the world. He was the embodiment and symbol of that virulent and burning hatred of all things American that led his country to catastrophe.

In the light of these typical comments, the following letter is of interest. It was written by Yamamoto to his friend and classmate, the retired Vice Admiral Teikichi Hori. The date is November 11, 1941, four weeks before Pearl Harbor, one week after the decision to go to war with the United States had been taken and communicated to the armed forces, four days after the Pearl Harbor task force had been ordered to its assembly point in Hitokappu Bay in the Kuriles.

Friend Hori,

Many thanks for all you did for me at the time of my departure. Your letter sent from Ofuna has been received.

1. My family I leave to your guidance while I am away.

2. I recognize that the general situation has already come to the worst.

How miserable it is to have to say, as did Admiral Yamanashi, that this is fate. But then further arguments pro and con will avail nothing.

Now that we have reached the stage where "the Emperor alone must grieve over the state of affairs in the land," the only thing that can save the situation is the final Imperial decision. But how difficult that will be, in view of the present situation in the country!

3. What a strange position I find myself in now—having to make a decision diametrically opposed to my own personal opinion, with no choice but to push full speed in pursuance of that decision. Is that, too, fate?

4. And what a bad start we've made, with one serious accident after another resulting from blunders from the very beginning of the year!

With cordial regards,

Yours, .

Isoroku.

V

There would seem to be a moral to this tale. That the Pacific war would be a naval war was well known in advance, and nothing in the progress of the conflict modified this view. Naval capabilities governed the course of the combat; on both sides the navies gained the important successes, suffered the determining defeats. But the remarkable fact is that neither navy desired war to come at this time. Both Admiral Stark in the United States and Admiral Yamamoto in Japan felt unprepared for war; both endeavored to avoid the conflict.

Yamamoto's feelings were shared by most of his colleagues, men who took the larger view of matters, who were competent to draw the military conclusions from comparisons of industrial strength, who knew that oceans, as well as being formidable barriers, are also highroads of invasion. These people did not want the war.

Insofar as responsibility for the conflict can be placed on a single group, it must be placed, as the Tokyo trials have shown, on the Japanese Army clique and on its allies in civilian life. Not content with the subordinate role of an armed service, the Japanese Army had created and fostered a revolutionary political movement similar in many ways to the Nazi movement in Germany. Profiting by the internal strains in Japanese society, the Army gang rose in the years between the wars to gain effective control of the government, the police, and the propagation of information. Narrow-minded, ignorant of the world, ignorant of naval affairs, believing only what they wanted to believe, and insulated from criticism, these people looked out upon the globe as upon a succession of Chinas ready for domination. Germany's successes seemed to strike their hour: the weakness of Britain, the American preoccupation with Europe, the apparently imminent collapse of Russia, combined to lure them on.

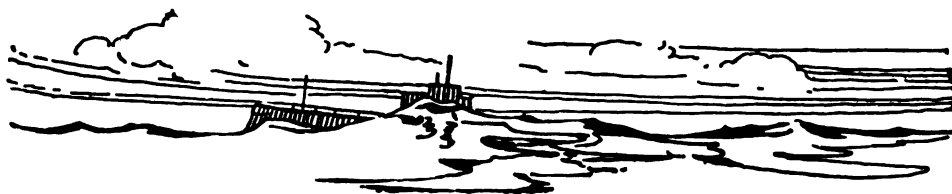
As a result of the 1936 cabinet change in Japan, the armed services had gained an irrevocable veto power over the actions of the government. Abstinence by either service from the formation of a cabinet, or withdrawal from a cabinet once formed, meant the fall of the ministry. This veto was not exploited by the Navy, which continued more or less faithfully to observe the rescript of the Emperor Meiji enjoining loyalty to the civil power. The Army, however, conspicuously avoided such self-restraint with the result that by 1941 the Navy had been

maneuvered into a position where it could not help itself and where, despite feeble gestures of resistance, it felt forced to go along.

Those who lose their freedom pay a heavy price. It was the fate of millions in our time to have found themselves swept up in a storm not of their own making, sent forth to conquer and die by governments over which they had no measure of control. Such was the fate of Yamamoto, and this is what makes his story a tragic one despite the fact that in the conventional view he was a "militarist," a type close cousin to the Prince of Darkness.

For Japan's war with the United States was not brought about by militarists *qua* militarists. Though important, their military attributes were secondary. The crucial fact was that a group had gained the power to commit the government subject to no restraint from outside, that it proposed to use this power, and that its wisdom was not equal to the task. Provincial, limited, and doctrinaire in their outlook, the Japanese Army radicals were also irresponsible in the final sense of the word—they were responsible only to themselves.

Intent upon their own twisted vision of Japan's future and upon their own personal fortunes, they tied their country to the Axis. Having so tied it, they engaged in diplomatic dispute with the United States, involving themselves so deeply that they had either to back down or to fight. With such a choice, such a group of adventurers could come to but one decision, the decision to take the gamble. The key to the situation was the absolute nature of their power, the fact that no other group had either check or influence upon them. It is neither the first nor the last example in history of the corruption worked by power. A similar condition is in large measure responsible for the dangers that confront the world today.





Official U. S. Coast Guard Photograph

IN TRAINING FOR H-HOUR

Military drafts have long been used by European Powers, but it is only in the last decade that the United States has known a peace-time draft.

PREFACE TO LEADERSHIP

By HERBERT G. TELSEY

No longer, in any quarter, is it an obscure fact that the United States has arrived at an important juncture in history. The world situation has projected our country so far into the foreground of events that its place in the limelight is, if anything, too prominent for comfort. We find ourselves, as it were, "Standing, with reluctant feet, where the Brook and River meet." Our expectation, along with that of the rest of the democratic and some of the non-democratic world, is that we will handle ourselves confidently and competently despite our lack of that longer political seasoning which other great countries have had before rising to a position of equal pre-eminence. In this general picture, our military and naval affairs are of the greatest moment, not only to us, but to all.

Small wonder, then, that since the end of hostilities a question of great public interest has concerned the size and organization of the armed forces, together with the means of providing adequate numbers of personnel to carry out the commitments for which we have made ourselves responsible. On the whole, we have passed rather easily from our pre-Pearl Harbor notions to new ideas. Who in 1940, even though the European war was in progress, would have prophesied a peacetime draft eight years later? Far from denoting apathy, such a development points up the flexibility and the fundamental good sense of the American people, upon which two qualities so much of the victory depended in war, and still depends in peace.

With our armed forces, the situation is still fluid; important matters of organization and control remain unsettled. But this much is certain: whereas heretofore our Army and Navy were constricted organizations capable of huge expansion for war, hereafter our three armed forces must be machines built for war, capable of being maintained in a suitable kind of reduced-but-ready status. Despite the financial burden implied by this conclu-

sion it appears to be inescapable, and we must accept it until considerable further stability is attained in international politics.

Because of increased public interest in military affairs, a great deal has been said and written since V-J Day about the discipline and internal philosophy of the armed forces. In regard to these matters the situation is likewise still fluid—no final results are apparent in any objective sense, and cannot be for some time to come. It seems as if the surveys and arguments that have appeared in so many publications have not, even yet, fully explored the subject. And the subject, for the first time in our history, has become of permanent importance to our people. It is therefore one that will come up, again and again, until all existing dissatisfaction has been replaced by substantial approval.

In general, the published comments on the discipline and internal philosophy of our forces have taken one of two main lines: that of strict orthodoxy, or that of destructive criticism. The first approach is summarized in the trite argument that "an army can't be run without discipline," and the second is epitomized by the disgusted GI or naval veteran who "would rather do anything on the outside" than stay in. Obviously neither of these attitudes can ultimately prevail. Just as plainly neither is devoid of all merit. A final adjustment between them is inevitable, important, and greatly needed, but has not yet been attained or even closely ap-

WITH UNDERGRADUATE and law degrees from Harvard University in 1936 and 1940, Mr. Telsey served in the U. S. Coast Guard Reserve before Pearl Harbor, and subsequently in the Naval Reserve. In 1942 he served in district patrol craft in the New York area, and later helped in the seaboard delivery of 42 LST's constructed on the Western Rivers. After subsequent service on the seaplane tender *Tangier* in Japanese waters, he was discharged after V-J Day with the rating of Quartermaster, First Class.

proached. Much depends upon such adjustment. Without it the peacetime draft, so ardently desired by the services, must prove a boomerang.

As in all things, a cool, clear, detached approach is essential to constructive thinking. Therefore, neither the ingrained beliefs of one group nor the fresh resentments of the other should be permitted to becloud our vision.

The first salient fact to be bravely recognized has indeed been accorded recognition, although not very loudly. It is that a large number of the sovereign people of the United States, in uniform, were mightily offended during World War II by certain of the basic military tenets and usages governing them. Wartime soldiers and sailors may have been similarly offended before; if so, no crisis resulted. There might be no crisis now, but for the fact that the armed forces, along with the rest of the nation, have arrived at a historic crossroads. The logical conclusion is that a satisfactory settlement of existing differences in ideas must be reached. Otherwise, an unsatisfactory settlement may be precipitated at some future time. Sovereign power remains in the hands of the people, to whom it belongs; its exercise against the retention of such military usages, customs, and regulations as antagonize the people is only a question of time unless a settlement is effected, or unless all unsettled issues should be merged in the devastating fact of a new war—something to which no one looks as a solution to any domestic problem. Let us realize, therefore, that we have a job to do, which, if well done, will pay rich dividends.

The next important point to be candidly recognized is that the door is not closed to improvement in military ideas. One of the numerous magazine articles dealing with the proposed peacetime draft pointed out that George Washington thought we should have conscription in peacetime. Our present problem, succinctly stated, is to develop the very discipline and internal military philosophy we would have evolved by now if our first President's thought had been effectuated. Had the United States always had a system of peacetime conscription, the rough edges of that problem would most certainly have been well worked down by the present time. In-

stead, the military have always been a class apart, with brief interludes in which they first swallowed and then disgorged a huge civilian component. That era is past. Let us all be aware of the fact.

The third important point is that, notwithstanding the other considerations, we must always have stricter and more rigid discipline in military than in civil life, together with unquestioning obedience to orders and unshakable respect for duly constituted authority, so that military discipline is different in kind from civilian discipline, to a certain extent. Some writers have recently taken pains to justify the very necessity of military rank and discipline—have, as it seems, assumed that resistance to those entire ideas has lain at the root of the expressed dissatisfaction with certain of their features. Nobody, least of all a veteran, can reasonably doubt that when a wartime commander conducts his fateful symphony, his orchestra must respond to the full, without wasting time or energy in considering the merits of the selection or of its interpretation. Let us therefore not be ashamed of the austere requirements of war.

What we have to face, consequently, is not a prospective revolution in military customs, but rather an effective program of readjustment. The outlook should not create concern for the cherished and painfully built ideals of the military services—ideals that are and always have been perfectly sound—but rather should create enthusiasm for the essential and profitable task of shaping a military society more nearly suited to our condition, and therefore a tool of vastly increased potential power. The nub of our difficulty is, very simply, the hardship of separating those features of military society which are traditional yet objectionable ornaments to the structure of the military services from those other features which are the foundation stones, the beams, and the girders of the military edifice. This task is more difficult than it should be because of the intellectual weaknesses of human beings (on both sides of any argument) in yielding to prejudice, preference, and self-importance at the expense of reason. Thus has it ever been, and shall be hereafter. But the work must go on. The only real question is whether

we will do it ourselves, or wait to have it done for us, inevitably and perhaps much less satisfactorily, in the future. Successful work performed by the services themselves in the near future is very much in order. Mere tinkering, however, is no less harmful when done by the services than when done by civilian critics. Any work that is done must be based upon some serious theory.

The mere antiquity of military organizations as a feature of civilized life is no guarantee that their present organizational discipline has evolved as far as is desirable. Admittedly, there has never been a political entity quite like the United States. One may suppose, boldly but perhaps quite soundly, that there has never been a foreign military organization quite like that which the United States ought to have. If so, we can hardly look to Europe for a model. Neither can we look to our own history and no farther. Our services have lived apart from our people so long that we cannot draw too much upon the past in making plans for the future.

Indeed, our traditional practices proved costly in an unexpected way during the late war. The wartime Navy contained many so-called "mustang" officers. Some of them were excellent officers, and others were men of ability, who, as commissioned officers, had no success in leadership. To try to ascertain the factor which produced such disparate results in men of essentially equivalent background was puzzling. Apparently it was something very personal. Now, one who has suffered much in an organization may tend to become proud of his sufferings. "I did it for many years, now let them do it" was the stock answer of the second type of "mustang" to all propositions involving less hardship for enlisted men. Their peculiar psychology went far to minimize their often good or even excellent efficiency and ability. The conclusion obtruded itself that there was a simple explanation—colossal self-indulgence. Here was the wounded enlisted ego of years gone by, now dressed in gold, salving itself at the expense of its masters—citizens of the United States who were winning a war for their country. It became quite evident that a deep-seated, subconscious resentment against the service, engendered in much the

same ways as the ill-will they were themselves creating in the enlisted personnel under them, was effectively preventing some of these officers from continuing to be good leaders. A great pity, and a great lesson. The fault was not theirs. Theirs was only a maladjustment; as the Navy's children, they had been dominated too much. Those who were of sterling character could recoup their loss; the others could not. Here is the core and kernel of the whole immense question. Surely there must be an organizational discipline for military service which will unfailingly, consistently, and uniformly give to Americans the things they require—individual opportunity, a degree of individual importance, self-respect—and which can yet be an organizational discipline which will provide the service itself with a full measure of all those features of subordination, obedience, and respect for authority throughout the chain of command which it needs and must have. The satisfaction of these various needs should not depend upon rank, station, or type of duty, and least of all upon anyone's personality or policy.

The two sets of requirements are not inconsistent. The best leaders have always managed to fill both sets of needs to a sufficient extent. But military organizations have not always required this fulfillment, or even made it easy, and in wartime it has not always been attained, at least not until the stresses of battle intervened to supply the deficiencies of leadership. From now on, in our forces, a better average of leadership than that just described would appear to be a necessity. Unless we find means to attain it, one may well doubt that the statement of the Army's Chief of Staff, when he formally recommended conscription in preference to a huge regular establishment, will ever come true. He said that the plan recommended by him was better calculated to capitalize the military ability of the American people. This cannot prove to be true unless the plan, having now been adopted at least in part, performs to the satisfaction of the people. The civilian citizens will insist upon and must be accorded great influence; if fundamental differences are allowed to remain between their basic beliefs and those of the armed services, the services will be com-

pelled, in the long run, to yield. *We must draw our strength from where it is.* Our strength resides in the length and breadth of the land.

A restatement of the elements of the overall problem under discussion is not a simple endeavor, but it may be approached thus: it appears that real progress often takes the form of effecting a workable reconciliation of apparent opposites. Civilization itself is mainly an attempted synthesis of mankind's animal and intellectual natures. (Its many defects can be tagged as imperfections in the attempted process. War is one of these.) Are there, then, conflicting elements in the organizational discipline of a military body? Patently, there are.

The military thesis is easily described. It consists in the ideals of discipline, service, and obedience which spell the difference between an organized body and an ordinary gathering. It has been summed up by a British admiral as "the one word, obey." But so complex a matter as organizational discipline cannot be summed up so concisely; only a thesis can be put in that way. Again, in the days immediately after Pearl Harbor, when the grave danger threatening our country put us all in the most serious mood we have ever been in, an Army officer said over the radio, "... from now on you will do as you are told. Iron discipline will win the war." He was addressing young people, and the statement was a natural one for him to make. At this time we might well inquire with great care what kind of discipline helped most to win the war. Definitely, something much greater than the iron discipline the general had in mind.

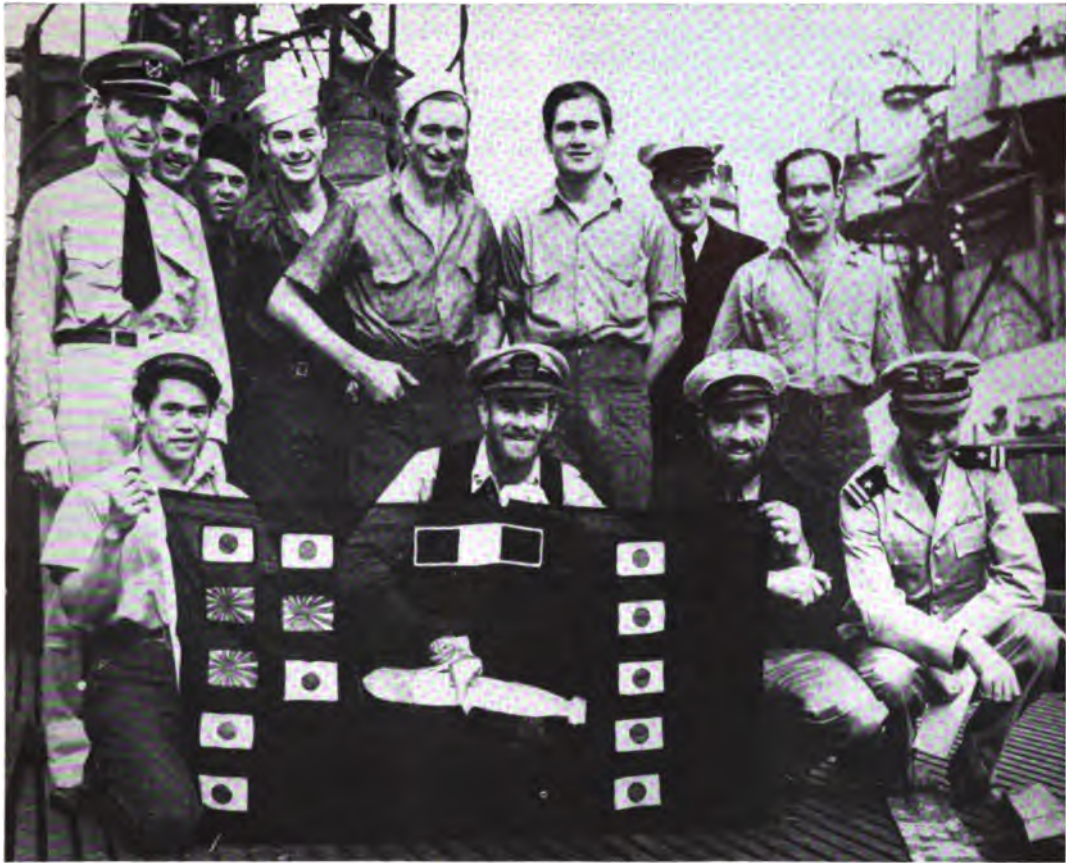
The military antithesis, on the other hand, is not easily stated. Commonly it is called "individualism," but the full meaning of that word is difficult to assess. Individuals themselves are all too often rather hard to assess. The eternal mainspring of each individual, however, is his ego. That word is a well chosen one; indeed we might still more appropriately use the emphatic, *egomet*. Not even the "typical Prussian" could ignore the ego; he derived self-esteem from the simple fact of being organized. We must serve our ego in some other way. Indeed, our doctrines of naval leadership, as officially promulgated,

recognize the vital importance of each individual's self-respect and pride. But our organizational discipline has often failed, in many respects, to give life to our doctrines of leadership. We must cure this illness.

There are, of course, those steeped in the military thesis who would feel that looking to the ego for the key to improvement would amount to sabotage. So it might, were we seeking to substitute antithesis for thesis, but not if we are seeking to make progress.

Why are commanding officers who impose a high standard of proficiency and efficiency upon their commands generally well liked and respected (if they are also respectable men)? Not so much because the persons under their command admire and respect the commanding officer for his own sake (although they do) as because they admire and respect themselves for their association with him, and for the achievements they have been made to attain. Such a man is a successful leader. There is nothing wrong in the egoistic features of his success; all success is entirely desirable. A taut ship is a happy ship if it encourages self-respect on the part of the crew; otherwise it is known as a "hell ship" and is anything but happy. Moreover, the success in performance of duty which "hell ships" have sometimes attained in the past was purchased, not merely too expensively, but with a currency that is going to be called out of circulation—namely, the abuse of power. To counterfeit successful leadership is not going to be as easy as it has been. Of course it was never possible to more than a limited extent, but there has been an area in which a leader could get unearned results:

Progress, as we have said, is very often a struggle toward more perfect synthesis of apparently inconsistent things. A particular conflict may be describable as one between reason and emotion, art and science, the practical and the ideal, or otherwise, but each crisis springs out of some imperfect balance, and each failure out of inability to find a better balance. In any given case, the completely irreverent and pessimistic conclusion is that thesis and antithesis, while perhaps equally valid, are truly irreconcilable, so that we are compelled to make a definite and permanent choice between them.



Official U. S. Navy Photograph

TRIUMPHANT CREW OF A RETURNING U. S. SUBMARINE

Submarine crews, like other small units with heavy individual responsibility, become elite units through pride of accomplishment.

Faith in progress, on the other hand, is a belief that there is an ultimate unity in nature which prevents the first conclusion from being true. If we have that belief, we must also believe that evil stems from yielding everything to either thesis or antithesis, after the manner of fanatics. Sometimes people put their trust wholly in the one or the other of the opposing propositions because they would rather work for it than remain conscious of any conflict; this one-sidedness lends a comforting purpose to their lives. And so there is a classical type of military man who, believing fanatically in the military thesis, has no doubts. Also, he believes that warfare, including personnel administration and leadership, is the one art which has been pushed, and long ago too, into

its last full flower of development. Of him we must beware.

Morale is not to be found in anything but a team. To some extent, we can all identify our own ego with that of the group—if we may ascribe an ego to the group. But we Americans cannot carry this affinity to its logical extreme of complete or substantial merger. The American people are well acquainted with disciplined teamwork; they do not, however, believe in regulation as an abstract divinity. Their attitude toward the 18th Amendment was a prime example of that fact in recent times. Their attitude toward the government of George III should not be overlooked, either—and many of those who served in the late war, like the colonists, experienced tyranny in action.

With us, a team that had achieved synthesis in its organizational discipline would be one in which each individual serves the unit as an undivided part of it and where, at the same time, his function and his ego are reasonably happy together. Such a condition is a legitimate and most desirable goal of leadership. Is it rash to venture the opinion that this has been the condition, more or less, of those American units which have been most successful in respect to morale? What about units like air and submarine crews, and certain intelligence activities, wherein military virtues are practiced by small groups or even isolated individuals? Service in these units denotes more than average individual responsibility. Such service is more satisfying to the ego, and the units concerned are elite on that account, quite as much as on account of having select personnel. Therefore, an organizational discipline which takes proper account of the individual ego would be taking account of the military antithesis.

We hardly need remind ourselves that the individual ego must not be allowed to run away with the team; that way lies disaster. (Let us also remember that this truth is no less applicable when it involves those in a superior position. The superior who not only fails to respect his subordinates, but is actively hostile toward them, is by no means unknown. What shall we say about such a superior? Principally that he is self-indulgent. The fussbudget of high military rank, also, is an example of a self-indulgent person; his fussiness serves no other purpose so well as to satisfy his own ego, unless it be to bolster the ego of those subordinates who succeed, from time to time, in pleasing him. The first type of superior is fatal to morale; the second is detrimental to it.)

Considered in slightly different aspects, the egos of leader and led provide an understanding of most of the minor difficulties and annoyances in the day-to-day practice of leadership. Whenever high-handedness of a leader is in excess of what the situation justifies, trouble is born. Again, recalcitrant subordinates can often be salvaged through an appeal to their own ego when other methods fail to produce any gain, for self-esteem is the last personal characteristic to

die in the destructive process of disgruntlement. And yet again, a job and an opportunity to perform it with some dignity and satisfaction are far more appealing to the ego than to function for appearance only, or to be imposed upon as a means of taking up the slack or covering up the weaknesses in plans and procedures, or to have the duty of providing for some contingency which will never happen, or to be and be made to feel not subordinate but servile.

We have, then, considered statements of the military thesis and antithesis. Notwithstanding the length of the world's military history and tradition, it is quite possible that some nation may yet materially improve the correlation of the individual and the collective aspects of organizational discipline. If so, who among the nations is as well qualified as we? We may properly recall once again that in the political history of the world there has not been another government quite like our own. One imagines that our native contribution to military history is only now to be fully developed. We have a great opportunity.

This paper has not undertaken any extensive discussion of particulars. There has been quite a bit of that, elsewhere. An attempt has been made, rather, to discuss principles. But there are two issues bulking so large in the problem with which this paper concerns itself that it seems imperative to include them as postscripts.

The first of these is military justice. Much has been written about it; many persons have taken the floor to defend the old system in its entirety. Comparisons have been drawn with the functioning of civil courts, and so on. The theory has been advanced that military justice is, in fact, superior to civil justice. Let us assume, without conceding, that military justice as administered during World War II was as good as civil justice. How does that help? It was nevertheless detrimental to morale. More so, perhaps, in some services than in others. What was there, then, which was detrimental to morale? From all reports, it was the unshakable conviction of enlisted personnel that they were not uniformly accorded equal rights before the law with other classes of military society. A defense of the procedural machin-

ery of courts-martial is so oblique a reply to this challenge as to evoke damaging suspicion. The hour grows late; such approaches do no good. Fortunately it seems as if progress is being made in connection with military justice. The efforts now underway, if continued, should contribute rich results.

The second of these matters has been known in the public prints as "caste." If one looks closely nowadays, one may observe some Army officers whose uniforms are hardly distinguishable from those of privates. If this is not an illusion, the criticism of "caste" must be responsible. The Army's move may or may not be a sound one. In either case, the complaints about "caste" are social, not sartorial. Such damage as has been done by "caste" in creating a great reservoir of ill-will (which was basically unnecessary) cannot be undone; one might as well pretend that Pearl Harbor never happened. But it is the future that counts now.

There seems to be no reasonable doubt that the traditional powers, privileges, and distinctions of our commissioned officers exceed those which are due to their office alone. Powers and distinctions necessary to the efficient execution of the office to which they are appurtenant must be zealously preserved. To identify these distinctions and powers and separate them from others is not easy, and is rendered more difficult by traditional doctrine, which recognizes no such division as is here suggested. But the truth is that

those powers and distinctions are even now doomed, which are founded merely on the historical fact that the commissioned and non-commissioned personnel of European military forces were fully and sharply divided in social and educational background, so that there was a clear distinction in fact between commissioned officers and other personnel. Of this distinction the first group naturally took full advantage. It seems a perfectly safe prediction that, in the future, the body of officer personnel in all of our armed forces will be less and less like the description of Marcus Goodrich—an "aureate nimbus from which the ever-present lightning plays." That body must, therefore, become more and more a military aristocracy founded upon *merit* alone, whose members will have powers, privileges, and distinctions conducive to the proper performance of their functions and assured to them through being necessary. These prerogatives may be broader than some persons now think, and narrower than others suppose. It is impossible to foretell. But they will be redefined, to the end that in a future day, when every American in uniform consistently and unimpededly feels himself individually responsible for the organized endeavors of which he is a part, our strength will be greater than now. We shall then have written our native Preface to Leadership, whose swiftly following chapters will show brilliance on every page.



THE ALARM CLOCK AND THE DECANTERS

Contributed by REAR ADMIRAL ALEX M. CHARLTON, *U. S. Navy (Retired)*

A British battleship captain encountered one of his young sub-lieutenants at a big party one afternoon, and after observing him for some time, finally said, "Young man, I've been watching you this afternoon, and as one with long experience talking to one who is just starting his career in the Navy, I want to give you a bit of advice about drinking. You must set up some standard, some alarm clock, to tell you when you have had enough, and then stop, period. For instance, when those two decanters on the sideboard look like four, then it's time to knock off for the day."

The lieutenant cast a startled glance at the sideboard and murmured, "But Captain, there's only *one* decanter there now."

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS.)



Official U. S. Navy Photograph

NAVY AIR TRANSPORTATION IN THE ARCTIC
Unloading pipe for the Navy at Point Barrow.



Official U. S. Navy Photograph

NAVY OVERLAND TRANSPORTATION IN THE ARCTIC
The wanigan section of a tractor-train.

NAVY OVERLAND TRANSPORTATION METHODS IN THE POLAR REGIONS

By GEORGE W. GRUPP

ONE of the chief obstacles to construction progress, economic development, and human survival in the Polar Regions is the lack of, and the difficulties of, transportation.

The Navy's Bureau of Yards and Docks is taking an active part in solving this problem because the Navy is aware that most of man's needs for survival in the Polar Regions must be transported to him from the temperate zones.

If we hope to make it possible for a large number of human beings to live in the Polar Regions, then it is necessary to develop an adequate, dependable, fast, and suitable means of transportation. To attain this objective the Navy is doing a lot of pioneer work in overland freight transportation.

At present there are no railroads in the Polar Regions. Most of the areas have no roads. Within the bounds of certain limitations, air transportation has made the Polar Regions accessible throughout the year. Surface vessels can directly serve most sections of the Polar Regions only two months in a year because of ice.

From certain Polar Region points of discharge of cargo, either from air or surface ships, goods and equipment are conveyed by the Navy's Bureau of Yards and Docks to their final destinations by dog sleds, or by tractor-trains which consist of trailer units mounted on bobsleds, go-devil sleds, or tracked atthey wagons drawn in tandem by tracked wheel tractors.

Usually a BuDocks tractor-train is made up of a wanigan section and a number of freight sections. Each freight section consists of three trailers which have a total average carrying capacity of about 50 tons. On the other hand the wanigan section is made up of a combination galley and crew quarters, and two repair shops equipped to make any kind of tractor-train repair or part replacement job.

The first step in Navy Polar Region overland transportation is the selection of the best and safest route between the freight's points of origin and destination.

This necessitates studying the available aerial photographs, maps, and the making of an aerial reconnaissance survey.

Next a land reconnaissance party, with experienced guides, go over the proposed route with three objectives in mind: (1) to eliminate grades in excess of 10 per cent, (2) to determine if ice bridges must be constructed across streams of water, and (3) to avoid zigzag trails on slopes since they cause the shifting and tipping of trailer loads.

Over long routes daily aerial reconnaissance trips must be made to ascertain the shifting of snow. An advance party, perhaps in a weasel, is sent ahead to secure information which will enable the trail breaking crew to move and work with dispatch; for in areas of tall grass, deep snow, or uneven ground, a bulldozer, preferably of the insulated hydraulic type, must be used. This bulldozer service is required to protect the radiators and engines of the tractors, and to make a reasonably smooth surface for the tractor-train. All of this is done to attain maximum efficiency in tractor-train operation and a high degree of safety to property and human life.

In loading and unloading the trailers various kinds and capacities of crawler tractor cranes and tracked and non-tracked lift trucks are used to handle a maximum of tonnage at a minimum rate of time and cost, and to save human effort, life, and limbs.

AT ONE time a professor at Webb Institute of Naval Architecture, Mr. Grupp is a traveler, author, and lecturer, and has been a writer for technical magazines and other publications since 1914.

Maximum tonnage and the height of trailer loads are governed by the terrain of the route. For example, such elements as kinds of obstructions and the effect of route twisting and roughness of trail surface on trailer tipping, are considered in determining the permissible height of tractor-train loads.

As a rule the height is not more than the width of the load; and it is never in excess of 10 feet.

Loads which require a wider trail than the width of a bulldozer result in extra work and delays in transit movement.

Since shifting loads will prevent drivers from keeping their minds on operating the tractors, therefore, for the sake of safety of life and property, and for speed in transit movement, all loads are securely anchored to their trailers before the tractor-trains start on their trips. Loose loads are boxed by flat lumber held in place by stakes. Such items as lumber and pipes are lashed down to the trailer bodies by chains and stakes, or by chains and chain-binders.

Every time the tractor-trains stop for refueling, for crew changing, and for mess, all loads are checked for signs of load shifting, and for other possible vehicle troubles. Since sled runners freeze to the ice or snow after only a reasonable pause, they are first broken free to avoid placing a sudden and undue strain on the tractors, which might cause them to fail.

The heaviest laden freight section leads the tractor-train to make things easier for the other sections. The wanigan section is always last.

If there is a freight section break-down due to a broken cable, coupling, cross chain, runner, or sled platform, or because of an overturned sled, sheared king pin, or tractor failure, the shop crew of the wanigan section remain behind to make the repair. However, if the break-down is of a nature which may delay the entire train, then all members of the tractor-train lend a hand to make the repair.

On long hauls the tractor-trains are operated on a 24-hour basis to cover great distances in the quickest possible time, and to avoid restarting cold engines.

Only experienced operators drive at night because of the added care which must be

exercised in driving across ditches and around curves. Extra gasoline lanterns, flashlights and batteries are carried for night emergencies.

For hauls of less than 100 miles the entire fuel supply is carried by the tractor-trains; but for greater distances, fueling stations are established. These stations are supplied by special fuel trains.

All tractors are winterized. For example, all batteries, carburetors, and other engine parts are heavily insulated. Engine exhausts, which form steam in low temperatures, are directed away from the operators' lines of vision. The operators' cabs are equipped with double windows, or with defrosting equipment, to give the drivers the best possible visibility. To prevent the operators and the cabs from becoming overheated, the warm air from the engine is governed by ventilating control.

Three main types of preheaters are used to start cold-soaked engines. One type is a self-powered unit, which consumes about 4 gallons of gasoline per hour and is capable of producing 250,000 B.T.U. per hour. This preheater is also used to heat planes, garages, and portable hangars. Its heat is applied to the tractors' batteries, crankcases, carburetors, intake manifolds, and oil pans.

Another type, a portable unit, which consumes $1\frac{1}{2}$ gallons of gasoline per hour, is capable of producing 100,000 B.T.U. per hour. This preheater and the first type mentioned operate at greatly reduced efficiency in temperatures below minus 35 degrees Fahrenheit.

The third type is a small portable unit capable of producing about 40,000 B.T.U. per hour. This preheater, which is unsatisfactory in temperatures below minus 30 degrees Fahrenheit, is only practical for the heating of small engine parts.

After preheating an engine preparatory to starting it, the engine may be given a boost by a special heat cartridge.

Because of the fire hazard, neither the ordinary blow torches or the plumber-type fire pots are recommended for preheating purposes, even though they sometimes have been put to that use.

In some cases, rather than risk cold-soaking from standing idle for a few hours in low temperatures, the engines are run continu-



Official U. S. Navy Photograph

GREASING A TRACTOR AT 'WAY BELOW

Note the winterized operator's cab and the packed snow in the tracks and rollers.

ously the full 24 hours of a day in the performance of certain types of work.

The tractors' engine hoods have solid side doors. Their radiators are provided with curtains or hand operated shutters. This is done to maintain the proper temperature in the engine compartment and to keep out the snow.

The intake air for the engines is drawn from protected parts of the tractors, such as the drivers' cabs, to prevent snow from being sucked into the compartment.

Improvised winter tracks are used because they increase the towing capacity of tractors about 50 per cent. When these improvised winter tracks are not available, the standard, or summer, ones are altered to serve for winter usage by cutting 3-inch square holes into their track plates over the drive

sprocket line, to prevent excessive tension by snow packing inside the sprockets. The 3-inch square pieces of steel cut from the track plates are cut in half and then welded to the existing cleats to increase traction on ice, in marshy tundra, and in mud.

Since track carrier rollers fail to function when they become clogged with snow, the top rollers are replaced with properly shaped hardwood blocks. Steel plate guards are placed on both sides of the roller frames to keep out gravel, ice and snow. To prevent tractors from digging themselves into deep loose snow, and to increase weight distribution, track extensions are installed on the tractors.

Because of the twisting and pitching tendencies of tractors when operated over irregular frozen ground, extra heavy duty



Official U. S. Navy Photograph

BOB-SLED BOUND FOR UMIAT

Stout runners, stout chains, and stout coupling gear are precautions against trail mishaps.

equalizer springs are used.

Most tractors are equipped with winches and with front pulling hooks to enable them to perform both salvaging and towing operations.

The freight bob-sleds, designed to permit runner free knee-action, and to restrict draw-bar tension to the chains extending between the lower bolsters instead of the king pins, give satisfactory tractor-train service.

The camber runner "go-devil" sleds are satisfactory for a terrain blanketed with frozen snow. But in deep, light snow their pay loads must be reduced because of their low bed clearances.

Since wheeled vehicles require graded roads for efficient operation, they will never replace the tracked vehicles in certain areas of the Polar Regions.

The ideal type of vehicle for this part of the world would be a powerful and rugged amphibious vehicle, with reasonable speed and not too heavy, which could make its way

with equal ease over frozen ground, ice, rough terrain, thawed muskeg, snow, and across streams of water.

Diesel engines are preferred to gasoline engines in Polar Region tractor-train operation because of their dependability and their lower rate of fuel consumption per horsepower.

Carefully planned daily, trip, and weekly inspections, and a periodic preventive maintenance system, keep the Navy's tractor-train equipment in the best possible operating condition. For example, after every 12 hours of operation on the trail, all tractors and hauling equipment are completely lubricated and serviced.

These and other methods indicate that the Navy is already in the possession of experience data which are valuable in establishing an adequate and suitable Polar Region overland transportation system which cooperates with nature and supplies the daily wants of man.

Those Amazing U. S. Submarines

DID YOU KNOW

That MacArthur said, "I will return!", but the U. S. Navy's submarines *never left* the Philippines.

That American submariners are credited with shooting down a Japanese torpedo bomber at Pearl Harbor.

That the first enemy warship ever sunk by a U. S. submarine was a Japanese submarine torpedoed off Midway.

That U. S. submarine raiders were operating off the coast of Japan within a few days after war was declared.

That the Japanese started the war with a torpedo far superior to the American, but American subs soon proved far superior to Japanese.

That U. S. submarines participated in every major operation and sea battle in the Pacific.

That U. S. submarines led the way in "Operation Torch."

That the old "Sugar Boats" held the line in the wild Aleutians.

That two U. S. submarines collided *under* the South China Sea.

That U. S. submarines transported American troops, evacuated refugees, landed secret agents behind enemy

lines, carried supplies for the Philippines underground, reconnoitered and photographed dangerous enemy beaches, and performed scores of similar special missions.

That U. S. submarines cut the main Japanese oil line and by so doing all but stranded the Imperial Navy.

That a U. S. submarine torpedoed a Japanese omnibus.

That a U. S. submarine, while diving, was rammed by a Japanese plane.

That American submariners landed on the Japanese mainland and blew up a railroad train.

That a U. S. submarine torpedoed and sank a Japanese battleship.

That a U. S. submarine sank the biggest ship ever downed by a submarine in world history.

That the operating personnel of the U. S. Submarine Forces, composed of only 1.6% of the total personnel of the U. S. Navy, sank 54.7% of all Japanese merchantmen and 29% of the Japanese men-of-war downed by *all* agencies (air, sea, and land) in the Pacific conflict.

All these facts, and others equally interesting, are told in UNITED STATES SUBMARINE OPERATIONS IN WORLD WAR II, shortly to be published by the U. S. Naval Institute. Prepared by Theodore Roscoe for the Bureau of Naval Personnel from official records, patrol reports, and material assembled by Submarine Force historians under the supervision of Rear Admiral R. G. Voge, U. S. Navy, here for the first time is told the complete, authentic story of the U. S. submarines, from the first U. S. submarine shot of the war to the last. Composed of over 800 pages of action-packed narrative and more than 200 photographs, charts, and original illustrations, this is not only one of the world's greatest adventure stories but it is also one of the most beautiful examples of fine book-making to appear in years.

It is the special request of the Navy that this history be made available at the lowest possible price to all service men, ex-service men, and all others especially interested in the Navy and its personnel. The U. S. Naval Institute therefore is offering you UNITED STATES SUBMARINE OPERATIONS IN WORLD WAR II at the special price of \$5.00 per copy, postpaid, *if you order now before publication date*. (After November 15 the price to the public will be \$10.00 per copy, postpaid.) If you are a member of the Naval Institute, all you need do is mail your order in on a postcard, and you will be billed for the book after it has been shipped to you. If you are not a member, merely fill out the order blank below and mail it in with your money order or check. Orders will be filled as soon as books are received from the printer.

You may order as many copies as you please at this special pre-publication price *if you send your order in promptly*.

SPECIAL ORDER BLANK

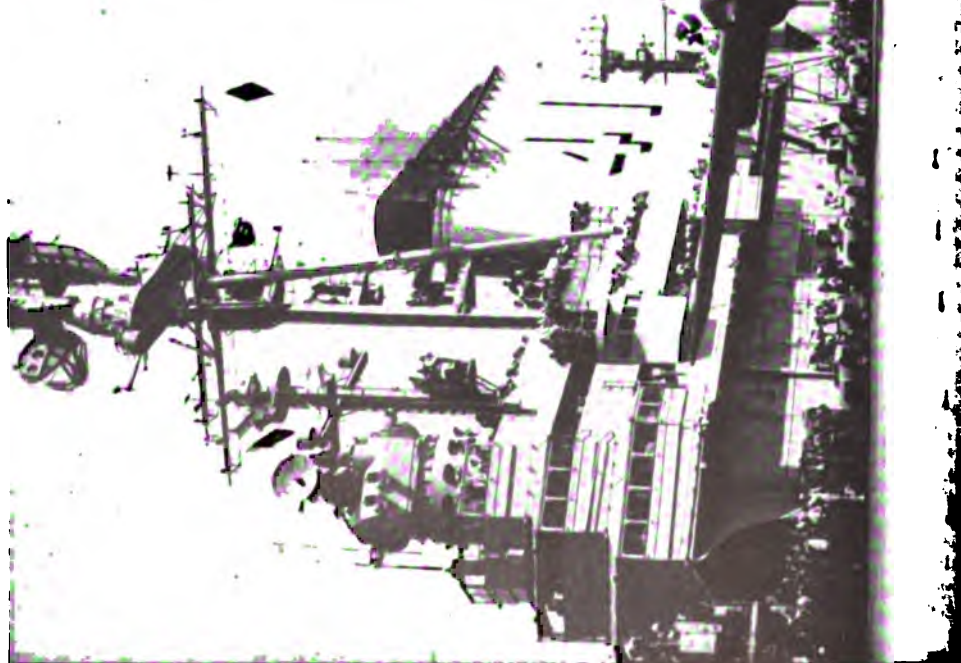
U. S. Naval Institute
Annapolis, Maryland

Please send me copies of UNITED STATES SUBMARINE OPERATIONS IN WORLD WAR II, for which I am inclosing herewith check (or money order) for \$.....

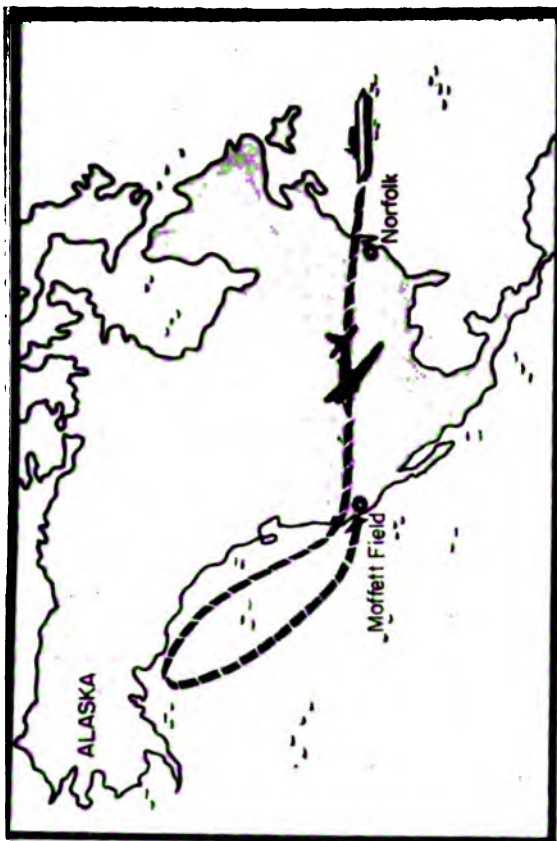
Name

Address

.....



Official U. S. Navy Photograph



EXTENDING THE LONG REACH OF THE NAVY

Navy Neptune patrol bomber taking off from the carrier *Coral Sea* off the Virginia Capes. Insert map shows the 4,000 mile route flown non-stop from the Virginia Capes to California, then on to Alaska, and back to final landing in California. A similar Navy Neptune holds the world's record for non-stop distance flight, 11,236 miles.

THE HISTORIC FLIGHT OF THE *CORAL SEA* NEPTUNES

By LIEUTENANT COMMANDER M. W. CAGLE, *U. S. Navy*

THE early morning of April 28, 1948, was a cold, wet, and depressing day in the sea off the Virginia Capes and Hampton Roads. But it was a historic occasion in historic waters for the United States Navy, and the dawn of a bright new day for naval aviation. Perhaps in some future time, this morning would be remembered with as much significance and nostalgia as that famous day in November, 1910, when Eugene Ely flew his powered box-kite off a wooden ramp aboard the U.S.S. *Birmingham* to herald the era of air for the United States Navy. For on this day two Neptune P2V2 bombers, sister-planes of the world's long distance record holder "Truculent Turtle," were to be launched from the flight deck of the battle carrier *Coral Sea*. A milestone was approaching.

This would not be the first time that bombers or big planes had flown from our carriers. If had been done many times in fact. But never a plane like the "Neptune." Colonel Doolittle's Tokyo raiders in Army B-25's had flown from the *Hornet* in 1942; and large Douglas transports had taken off from the carrier *Philippine Sea* in 1947 for Admiral Byrd's last Antarctic expedition. Bomber-type naval aircraft had always flown from our carrier decks—but they had been little, light, limited capacity planes whose combat range at best was only 300 miles. The "Turtle" had flown 11,236 miles to set a world's record for distance. It was a big bomber—with a wingspan of 100 feet, a height of 28 feet, grossing 58,000 pounds. This versatile plane could pack an array of guns, bombs, and rockets that demanded respect—or it could convert the useful load into gasoline for long-range search and reconnaissance. As one aviator jokingly referred to this long-winded aircraft, you could file a flight plan from San Diego to Anacostia, and list Seattle, Washington, as an alternate landing field.

With a raw wind blowing out of the east on the late afternoon of the 27th, the two planes had been barged alongside the *Coral Sea* and hoisted aboard. Seeing the cranes pick up these huge planes and lift them 75 feet in the air, and deposit them gently on the flight deck was quite a show in itself. When the job was done, it was amusing to see the sailors from the destroyers and cruisers nested near by come on deck, glance at the *Coral Sea*, walk away—and then, in a quick double-take, swivel around for another look at these unfamiliar aerial monsters stretching their broad wings across the deck.

As they sat on the flight deck of the *Coral Sea*, the more than nine hundred feet of deck length seemed too small. And yet, this was the biggest warship afloat—as big as three football fields, one sixth of a mile long, or farther than Jimmy Thompson could drive a golf ball. Usually a carrier dwarfs its planes; this time, the carrier seemed dwarfed.

To make sure the wings of the plane safely cleared the island structure during take-off, both aircraft were spotted on the left half of the 130-foot wide deck. A white stripe had been painted down the steel runway with a dotted one on each side to mark a path for the pilots to follow on take off. The nose wheel of each bomber sat squarely on the middle line. The wheels of the two airplanes were so large that ordinary sized parking chocks would not fit; instead, two

GRADUATING from the Naval Academy in 1941, Lieutenant Commander Cagle saw two years' destroyer service in the North Atlantic before taking flight training. After commanding Fighting Squadron 88 on the carrier *Yorktown* in the Pacific War, he served on the Staff of Commander Air Force, Atlantic Fleet, for two years. At present he is in command of a VF squadron based aboard the carrier *Franklin D. Roosevelt*.

conventional chocks were used—one in front of each tire, one behind.

This was the first time on a carrier deck that the crews had no stooping or crawling to do under bellies, wings and tails. On these planes, both wings and tail surfaces were so high that one could walk under them with head room to spare. Furthermore, the only pushing points for the handling crews moving the aircraft around on deck were the landing gear struts and the tail of the fuselage. One plane pusher remarked happily that these planes were *too* big to push—a tractor had to handle them.

The danger of those murderous propeller blades was still present, however. Since the earliest days of carrier aviation, this had always been a serious hazard—a man unwittingly or carelessly walking, falling, or sliding into them, especially at night, or when the decks were slippery with rain or oil.

Long after dark, and at full tide, the *Coral Sea* stood out, passing through the same water that witnessed the battle between the *Merrimac* and the *Monitor*. The crews worked until midnight in the damp air readying the Neptunes. Around the planes a cluster of sleepless spectators watched. Flashlights winked in the darkness. Engines were checked. Gas, oil, and hydraulic tanks were filled. Tire pressures were checked. Plane captains anxiously inspected the steel tie-down cables, for the big carrier was heeling slightly in a quartering sea. One of the chief petty officers commented that the planes looked so large that he feared a chunk of the deck would tear out whenever the *Coral Sea* rolled and the planes tugged at their tie-down lines. Someone reminded him that these were armor plate decks, not the teak decks of our *Essex* class.

Flight quarters sounded at 0630. Rain had fallen during the night, and the flight deck and catwalks were puddled with water. The sky was gray, the horizon was fuzzy with fog, and the morning breeze was wet. Directly overhead a patch of blue could occasionally be seen. Certainly it was not good weather, but it was flyable.

Last minute preparations were made. The steel tie-down cables were removed. JATO bottles were placed on the rails on the sides of the planes. "JATO" is an abbreviation

popularly translated as "jet assisted take-off" which describes nothing more than a strong steel cylinder with a propellant inside which burns and sends a tremendous jet blast through the exit nozzle, giving a powerful push forward. Actually JATO is a misnomer, being a rocket assistance rather than a jet assistance. The bottles were a little larger than a regular fire extinguisher and roughly the same shape. The nozzle end of each unit was fitted with a red cap (not unlike an over-sized coca cola top) which was marked: "Remove before Firing."

Crews manned their planes, Commander Tom Davies (who piloted the "Truculent Turtle") and his co-pilot, Lieutenant Espy, climbed the ladder into Number One. Radioman, plane captain, and gunners followed. A few small personal gear bags were passed up.

The big bull horn on the flight deck roared out. "Secure all loose gear about the decks. Check wing lines and tail chocks. All spectators clear the flight deck and catwalks." And in another minute—"Start engines on Number One!"

Commander Davies' plane responded with a roar. The 2500-h.p. engines, swinging square-tipped, 14-foot, 3-bladed propellers soon made conversation difficult. As the plane's engines warmed, the U.S.S. *Coral Sea* was beginning to increase her speed and turn into the wind. At 0715, all was in readiness. Again the bullhorn spoke: "Cape Henry bears 285 degrees, distance four seven miles. Wind across the deck is 32 knots. Take off when ready." The Fly One officer gave the co-pilot the usual wind-up signal with his forearm. The co-pilot nodded. His task completed, the dispatcher turned and walked to the edge of the deck.

At 0716, Commander Davies advanced both throttles to full power. Anticipation ran high. For what seemed an eternity, the two engines thundered a tornado of slipstream down the deck. Still the plane did not move. Suddenly, there was a loud whooshing noise as the JATO bottles let go. The pilot relaxed his brakes and the big plane roared down the deck, accurately keeping inside the painted stripes. Over the bow the big plane was airborne. The *Coral Sea* became blanketed in the billowing white exhaust of the JATO bottles; for a few seconds all

spectators were fogbound. When the smoke had dissipated, the Neptune was far ahead of the ship, eating up altitude hungrily.

The second plane was readied. Lieutenant Commander Wheatly and his co-pilot, Lieutenant Commander Tory, were waiting in their plane. It had temporarily taken on a grayish color from the smoke of the JATO bottles. For a moment, while starting engines, one engine wouldn't fire. Would this plane be a dud? In a few seconds, however, the engine had taken the prime and was running smoothly. The co-pilot opened the hatch above his head and began wiping the moisture off the cockpit canopy.

Overhead, the first Neptune was putting on quite a show. Wheeling around the ship, disappearing occasionally in the low scud clouds, Commander Davies established a race-track pattern. On each turn, he flipped the big ship up on a wing in an incredibly steep bank. Needless to say, the observing carrier pilots, accustomed to highly maneuverable single seaters, were duly impressed.

Again, all was in readiness. Again the *Coral Sea* turned into the wind. The Neptune's engines roared, the JATO was released, and in seconds, plane Number Two was airborne. Here and there, a few personal wagers were paid off by those who had bet on the length of the take-off run, and had overestimated. One carrier pilot was heard

to remark, "I never got off as fast as *that* in my airplane." The consensus seemed to be that each Neptune could have safely taken off with either engines or JATO—one or the other. Using them at the same time made the launchings resemble a paper wad's acceleration from a schoolboy's rubber band. Judging from the smiles of all observers, the operation was an unqualified success.

Why were these flights historic? In reality, they had been easy, uneventful, even routine. At no time did any observer doubt the success of the operation. Primarily, of course, the operation demonstrated that large aircraft can fly off a carrier with ease.

But even more important, the flights were historic because they gave naval aviators new hope for the future. New vistas were unveiled, new horizons revealed. Many of them, who sincerely believed that the last great war had brought the carrier and carrier warfare past its peak of usefulness, now saw in these flights even greater opportunities for service to the nation. Many of them, long accustomed to thinking of the carrier as just another sea-going ship, now began to appreciate the carrier as a base, a highly *mobile, self-supporting* base. They remember that this base always had a 35-knot wind down its runway and that its *runways are always obstruction free*. To them, naval aviation's future had never been so bright.



ALL IN A LIFETIME

Contributed by CAPTAIN COLBY G. RUCKER, *U. S. Navy*

There used to be a Lieutenant Commander instructor in the Steam Department at the Naval Academy who was thoroughly convinced that aviation was *not* here to stay. In all other respects he was a perfectly normal and even a likeable officer.

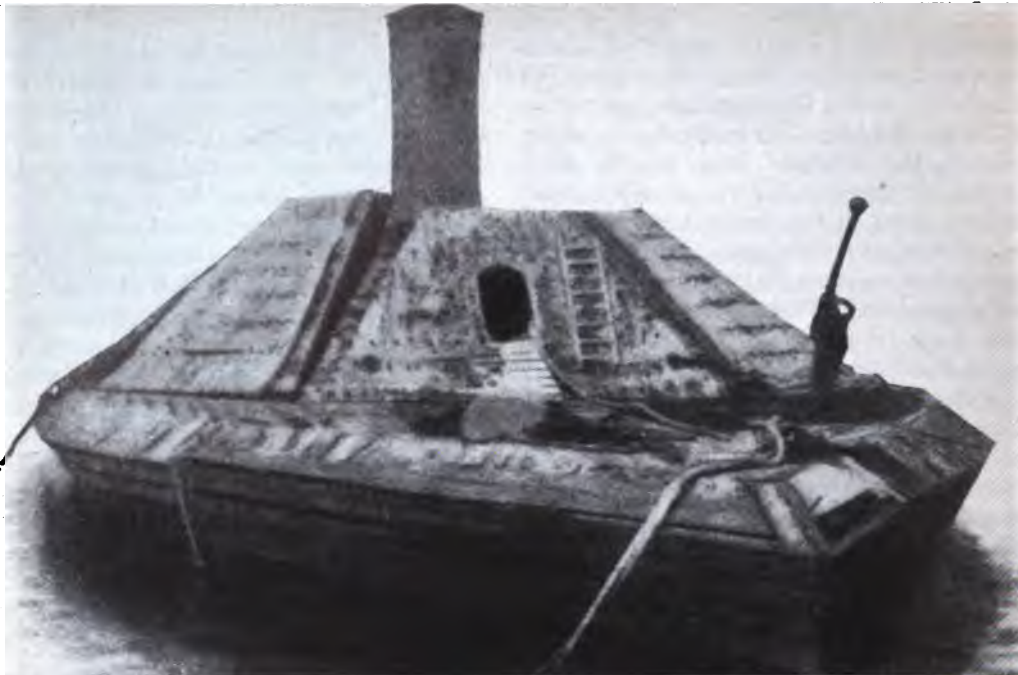
Now, as everyone knows, whenever the lesson happens to be particularly hard, or the class as a whole is ill-prepared for some good reason such as a coming football game, the midshipmen desperately try to get the instructor talking on any subject except the lesson in order to avoid being called on to recite. Some officers respond to questions relating to submarines, pay, or the advisability of getting married on graduation. But the bait in the case of this particular officer was aviation, and the question posed by the midshipmen was always the same.

"Sir," a midshipman would ask, "is it true that the average life expectancy of an aviator is eight years?"

"Not at all," the officer would retort, "why, I knew one that lived for eleven years."

And no midshipman would be called upon to recite that period.

(*The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS.*)



Official U. S. Navy Photograph

NEW AND REVOLUTIONARY IN ITS TIME

The Confederate ram *Albemarle*, sunk by another revolutionary weapon, the torpedo.



Official U. S. Navy Photograph

NEW CONCEPT OF WORLD WAR II

In the *Kamikaze* and its suicide pilot, the Japanese developed one of the deadliest weapons of World War II.

A CHALLENGE FOR THE LINE OFFICER

By COMMANDER JAMES C. SHAW, *U. S. Navy*

THE Japanese pilot didn't have a chance; American bullets seared into his fragile craft, ignited the gas tanks and gouged great holes in the fuselage. Trailing a long streamer of smoke the plane nosed over steeply and plummeted into the ocean. A pillar of water rose and fell; then quiet reigned. The day was August 15, 1945, and the event marked the end of fighting in World War II. Aboard American ships, officers and men murmured prayers of thanksgiving; then all hands turned hearts and minds to the future for which they had fought. To the majority, objectives were clear-cut: a return to civilian life, a gathering of old ties, and a resumption of old ways. But for the relatively few who planned to make naval service a career, the course was poorly charted. In less than four years the Navy had experienced tremendous changes in methods, means, and philosophy. The changes were here to stay; how could the professional sailor adjust himself to the new conditions? The question was then and still is a challenge, and it is particularly severe for officers of the executive branch—the Line Corps.

In seeking an answer to the problem it is first necessary to analyze successful line officers from ancient to modern times, drawing parallels from the past which will guide us in the present. Secondly, today's situation must be clearly delineated. In this connection, the attitude and actions of the Navy Department are important; the definition and classification of line officers require scrutiny; and the probabilities for the future must be examined.

IN THE BEGINNING

Thucydides preserved the first accurate record of sea warfare, and his account of the Peloponnesian War provides a clue to the nature of the early naval leaders. Thucydides himself was an Athenian admiral, a high-born citizen, young, educated, and wealthy.

It is doubtful that either he or his contemporary, the great Admiral Phormio, ever took to the sea as a profession; rather the peril of their city-state compelled them into the Navy. Whatever the Athenian leaders' origins, two characteristics stand out boldly; they were resourceful and they realized that there *was a difference* between land and sea warfare. These characteristics were illustrated in the Battle of the Corinthian Gulf (429 B.C.) when the Corinthians formed a superior fleet into a large circle with bows outward like the points of a compass rose. Phormio did not immediately attack but sailed round and round the enemy, realizing that ships subject to wind and current would give way under conditions where land forces would not. Just as expected, the enemy circle contracted until oars and vessels tangled hopelessly. At the height of Corinthian confusion Phormio attacked and easily won.

The Athenians again faced a superior force at the Battle of Naupactus and were further handicapped because the enemy insisted on battle within restricted waters. Phormio's pre-battle speech indicated his understanding of naval principles:

As for the battle, I will not, if I can help, fight it in the strait; nor will I sail there at all; being aware that for a few skillfully managed and fast sailing vessels, against a large number unskillfully managed, want of sea-room is a disadvantage.

A GRADUATE of the Naval Academy in 1936, Commander Shaw saw pre-war service in both the Pacific and Asiatic Fleets. He was serving in the U.S.S. *Atlanta* when she was sunk in the Battle of Guadalcanal. Subsequently he performed gunnery duty on the carrier *Bunker Hill* until she was "kamikazed" in May, 1945. Since that time he has attended the Naval War College, served on a fleet staff, taught strategy and tactics at the General Line School, and is now engaged in research and writing in connection with the *History of United States Naval Operations in World War II*.

For one could neither sail up as he ought to the charge, without having a view of the enemy from a distance; nor retire at the proper time if hard pressed; and there is no breaking through the line nor returning to a second charge—which are the maneuvers of the better sailing vessels—but *the seafight must in that case become a land fight and then the greater number of ships gain the superiority.*

In the 2,000 years following Phormio few Mediterranean naval leaders sailed the seas with anything but a landsman's philosophy. Even Athens forgot Phormio's precepts. In a fight with the Syracusans (413 B.C.), the Athenians permitted themselves to be bottled up in a harbor where the conflict became not a naval engagement but a land battle fought on floating platforms. During the Punic Wars, every effort was made by officers to discourage the other fellow from maneuvering. Seldom did a commander use his own mobility to advantage and the formations of the times fitted closely to the pattern of land tactics. At the Battle of Mylae (260 B.C.) the Roman Consul Duilius employed the sharp-beaked *corvus* to bring the enemy to grips with his seagoing infantry. At Ecnomus (256) B.C. the Roman fleet lined itself up like a battalion of legionnaires, and the Carthaginians also showed scant intuition about sea warfare by dividing their fleet in three separate elements susceptible to destruction in detail. As far along as the sixteenth century, at the Christian-Moslem Battle of Lepanto, the theory followed that a ship was but a vehicle for ground troops. The successful line officer of the Roman era and the Middle Ages can be characterized simply—educated and resourceful, but soldier rather than sailor.

AGE OF SAIL

In the meanwhile, away from the Mediterranean, an age of exploration had been born and with it came a new breed of seafarer. On the wide and turbulent Atlantic, it was not possible to hug a friendly coast, to sail long distances with rowing galleys, to vest command of a ship in a foot soldier. Instead, the hazards of deep sea navigation required the nicest kind of seamanship, the distances traversed insisted on wind-driven vessels, and the intricacies of sailing ships demanded experienced sailors. Prince Henry the Navi-

gator, in the early fifteenth century, discerned that navigation was a science and stimulated both research and practice which led directly to the exploits of Diaz and Vasco da Gama. Columbus, Admiral of the Ocean Sea, embodied the traits of the new type commander. In addition to the assets of learning and resourcefulness, he was an artful seaman and expert navigator. But he was seaman-explorer rather than seaman-warrior.

If we turn our attention to the north during this same general period, we find another royal Henry molding the shape of the line officer to come. Henry VIII of England was never one for getting along with rivals across the Channel and bulwarked his islands with a navy. But he ran into trouble; medieval mores insisted that battle leaders be recruited from titled gentry. Yet the possession of a title did not make a man a seaman; what could be done? He found one such "gentleman-seaman" in the person of William Fitzwilliam, who commanded the Fleet in 1520, later rose to Lord High Admiral and became Earl of Southampton. However, most of Henry's line commanders were like Sir Thomas Knyvett, captain of the ship *Great Harry*, and at the same time "Master of the Horse" and a soldier by profession. Actually, the seamen Henry wanted were already on the high seas, but they weren't gentle bred by court standards and they weren't part of England's Navy—not yet. They were men like Hawkins and Drake, primarily merchant-seamen, secondly privateers, and finally naval officers when the hour came to stave off the Armada in 1588.

There also appeared in Henry's reign the "Great Gun," a cannon which could destroy ships as well as men. So now antagonists stood off at a distance and pummelled each other before coming to close quarters. Maneuvers being vital in this mode of fighting, a new character, the naval tactician, was born. By the end of the sixteenth century, England's ideal naval officer was a composite of mariner, fighter, and tactician. Robert Blake, distinguished scourge of Dutch sea power, typified the combination. He had been successively Oxford student, merchant-sailor, Member of Parliament, and soldier, before becoming a "General-at-Sea" at age 50. Typical was his win over DeWith in 1652;

Blake threaded his formation through shoal water, gained the weather gage, and pounced boldly.

The rowdy smash-bang battles of the Anglo-Dutch Wars demanded leaders in whom victorious fighting meant more than either seamanship or tactics. Where Blake made mistakes, he frequently recovered by guts alone. But with Blake's passing a new and insidious influence seeped into the navies of the Old World. This was a French theory first expounded by Tourville setting forth formal rules to naval tactics, precise and unalterable. Tourville's ideas were pretty, but tactical performance and not victory became the object of battles. Thenceforth, in Mahan's words,

completeness of military achievement became in men's minds less of an object than accurate observance of rule, and in practice the defensive consideration of avoiding disaster began to preponderate over offensive effort for the destruction of the enemy . . . a period of merely formal naval warfare, precise, methodical, and unenterprising, emasculated of military virility, although not of mere animal courage.

During this period it was fashionable, nay imperative, that battles be fought as individual ship duels, each ship engaging its opposite number in the enemy battle line with no thought of exploiting enemy weaknesses or concentrating one's own strength. Aside from Tourville's disastrous influence, there was another reason for this purblind puerility; top-level leaders were now men old in years and older in attitude. The quality of resourcefulness so apparent from Phormio on down was smothered beneath regulations.

Happily a new crop of officers was maturing in the ships of England. Well-born, but usually untitled, this group clambered aboard as midshipmen, thirteen-year old "snotties," and with ability—though often abetted by influence—became captains in their early twenties. There was Hawke, fiery warrior, breathing a renewed fighting spirit into the officer corps; Rodney, master of form, daring to break with tradition by concentrating many ships against few; Howe, unruffled student, improving tactics and signals; Jervis, hard bitten sea dog, recognizing the place of strategy in fleet opera-

tions. A composite portrait of them shows a literate resourceful mariner-fighter-tactician.

The last of this restoration period produced Nelson, but it would be a mistake to describe astral genius together with other line officers of his day. Yet there is one illuminating facet to Nelson's career germane to this discussion; he was not a skilled ship handler and he knew it. Mahan analyzed the shortcoming thus:

This is a faculty probably inborn, like most others that reach any great degree of perfection, and while a very desirable gift, it is by no means indispensable to the highest order of naval excellence. . . . Nelson understood perfectly what ships could do and what they could not; no one could better handle or take care of a fleet, or estimate the possibility of performing a given maneuver . . . whether he had the knack of himself making a ship go through all her paces without a fault mattered as little as whether he was a crack shot with a gun.

At this time, expansion of the British Navy permitted officers to seek posts for which they were best suited by personality and preference. Saumarez was one of these, an orderly man who preferred duty as a ship-of-the-line officer wherein fleets maneuvered with majesty and method. His antithesis was Pellew, who loved frigates which gave him freedom to display his superlative seamanship and inspired initiative. Specialization within the Line had come to stay.

Meanwhile, across the Atlantic, colonial revolt brought forth American naval officers who had the same cut of jib as Pellew; independent fellows who relied on wit and audacity to counter superior strength. However, the backgrounds of American leaders remind us more of Drake than of Pellew. In almost every case they exuberantly embraced the sea at an early age, served as apprentices in merchant vessels, and became sea fighters through circumstance and patriotism. Unfettered by tradition or doctrine, they were ideally fitted for the maritime guerrilla fighting of the Revolution. Many were the occasions when an act of unexpected daring or a clever *ruse de guerre* befuddled an orthodox enemy. In 1779 the sloop *Winthrop* coasted alongside a British brig in the dead of night and Edward Preble led fourteen

men in a rush onto the enemy deck. Although greatly outnumbered, he routed the British out of sound sleep and convinced them to surrender in the face of superior numbers! In 1782 Joshua Barney in the 16-gun *Hyder Ali* engaged the 18-gun *General Monk* in a vicious battle. Barney had previously instructed his quartermaster to put the helm in the opposite direction from that ordered. Thus when Barney bellowed loudly "port the helm," the quartermaster put the helm a-starboard. The enemy heard and was fooled by the order so that the jib-boom of *General Monk* caught in the fore-rigging of *Hyder Ali* and enabled Barney to rake the enemy mercilessly and force him into submission.

After the Revolution, the American Navy went into the doldrums, officers returning to merchant ships or going ashore. It was not until 1798 that the people, roused by French insults, insisted on having a permanent navy manned by full-time officers. Thereafter, fifteen frigates and a dozen other war vessels were built and commands offered to veterans of the Revolution. To fill junior-officer billets, midshipmen were appointed directly to the fleet without previous sea experience.

One of these midshipmen, 16-year-old William Henry Allen, boarded the frigate *George Washington* in 1800. Allen matured in the Navy and by 1812, as first lieutenant of the frigate *United States*, was representative of the new professional naval officer. Over and above book learning and mastery of practical seamanship, he realized fully the value of discipline and training. He drilled the gun crews of the *United States* to perfection and when his ship engaged *Macedonian*, the fire from the American was so rapid that British tars thought their opponent was aflame. They changed their view when Allen's accurate gunnery knocked down rigging, punctured the hull, inflicted 84 casualties, and forced them to strike colors.

Allen next took command of the brig *Argus* with which he inflicted heavy damage on British merchant shipping before losing his life in 1813 in an unsuccessful action against the more heavily armed sloop *Pelican*. Significantly, the British buried Allen with highest military honors; no less than eight captains of the Royal Navy acted as

pallbearers. In the flowery language of his day Allen's character was described:

In the hour of danger he was calm, intrepid and persevering; in private intercourse guarded, affable and delicate. Entering into the Navy with large and expanded ideas of honour, the perils he encountered and the hard service he endured, consolidated his romantic and floating visions into rules and principles of action.

In addition to earning the professional respect of the British during the War of 1812, the American naval officer gained much more from his formidable antagonists. He fought against men bred in the tradition of Nelson and the intimacy of conflict was both example and challenge so that by war's end he was a resourceful seaman-fighter.

THE STEAM REVOLUTION

But there was trouble on the horizon, a column of smoke from Robert Fulton's steamer *Clermont*. If naval vessels had sprouted wings, the effect could not have been more revolutionary. Might as well throw all the tactical rules into *Clermont's* boiler. And that is figuratively what happened—though not overnight. First, steam was adopted into the Navy as a sort of step-brother to sail, but the youngster grew rapidly and soon became the prime mover. The immediate effect of this revolution was to cancel out superior seamanship as a "must" qualification for naval officers. There were other more subtle consequences; battles could now be decided in shipyards long before firing a shot. The designer and the engineer guaranteed victory by building speedier ships, coating them with iron armor, mounting them with the superior Dahlgren gun; and in every way taking advantage of technological developments that made war a contest of machines rather than of tactics.

Fortunately for the nation, there was a half century of comparative peace in which to fit machines into the Navy and new thinking into officers' minds. Matthew Galbraith Perry, over and above his diplomatic attainments, stood in the forefront of officers with prevision. He commanded the first successful steam warship in 1837, founded a naval library and museum, sponsored a naval magazine devoted to science and explo-

ration, advocated new ordnance, and recommended the steam ram. But could any one officer master all these new sciences? Trends indicated a divided mind. In 1836 the first specialist engineer was appointed and seven years later a corps of engineers established; on the other hand, experts like Dahlgren in ordnance and Maury in hydrography, retained line status. Still, it was patently obvious that the age-old scheme of educating the naval officer at sea was outmoded. In 1845 the United States Naval Academy opened its doors to some 50 midshipmen and, under the firm hand of Superintendent Buchanan, entered on a course of character building and naval training. The curriculum was predominantly technical with emphasis not only on navigation and tactics but on steam engineering and shipbuilding.

The Civil War broke out while Academy graduates were still too young for top-level commands so it was sea dogs of the traditional school of experience afloat who ran the show. The military character of these line officers, products of one age and fighters in another, is disclosed by an examination of their exploits. Farragut, a veteran of plucky *Essex* in the War of 1812, should have been a die-hard supporter of sail, but in 1838 he witnessed a bombardment of Vera Cruz by French vessels towed behind small steamers and from then on he crusaded for steam. In this action also, the French employed a newly invented explosive shell and this too won Farragut's support. Three years later, when the Americans besieged the same Mexican port, Farragut proposed an amphibious assault supported by guns of the fleet. Obviously he was bound neither by tradition nor timidity. When Farragut's big chance came at New Orleans, his willingness to try novel schemes resulted in chain mail on ships' sides, whitewashed decks (so gunners could find tools at night), hulls camouflaged with mud and ships trimmed down by the bow (so that grounding did not throw a ship broadside in the channel). In assessing this action, where a fleet in restricted waters engaged shore batteries at pistol range, we must conclude that neither seamanship nor classical tactics were decisive; resourcefulness and fighting spirit were the two essential qualities held over from the days of canvas.

Probably the ugliest ships ever to fly Old Glory were the river gunboats built and fought by Andrew Foote. This officer, another brought up in sail, forsook the past for this new specialty and with the ironclad hippopotamuses waded (almost literally) into action against the Confederate forts on the Mississippi. Tactics? Start out a mile away from the enemy with bow guns firing; close distance slowly so the Johnnies can't get the range; keep the armored bow pointed toward them so hits won't hurt.

Since Confederate officers sprang from the same service background as Union leaders, military character was similar. Improvisation and daring were cardinal rules illustrated by James D. Bulloch, who advocated radical changes in ship design; John Wilkinson, who developed blockade-running into a fine art; Raphael Semmes, who in the commerce-raider *Alabama* hurt the North painfully.

As for the younger officers on both sides, they were caught in the stream of progress and swept to sea with new ideas. William B. Cushing, with his unique torpedo-pronged launch, destroyed the ram *Albemarle*. And opposing Cushing in *Albemarle* was a fellow U.S.N.A. alumnus, A. F. Wharley, who was quite at home in the new-fangled ram.

Appomattox marked the end of brilliant achievement for the Navy and the beginning of a moribund sluggishness. The public, seeing no further use for a Navy, left ships and men to stagnate. Officers served in ill-found relics of the Civil War; promotion was slow and the future dim. Naturally enough, long looks went backward rather than forward and we hear of naval officers a score of years later still advocating the use of the ram, disregarding the fact that to ram, one must catch his foe—a tough task if future battles took place on the open sea.

In some ways the decadence of the physical navy paid dividends. Ambitious officers channeled energies in diverse directions; DeLong turned to exploration, Luce founded the Naval War College, and Mahan began his great writing.

Meanwhile, disturbing disagreements with European powers caused a change of heart by the people so that in the eighties the shipyards rang once more with the clang of metal

on metal as a new navy grew from keel up. When war came with Spain, Dewey and Sampson trod the decks of these men-of-war and won victory in short order. Dewey's bold entry into Manila Bay was reminiscent of Farragut and his decision to fight a running battle instead of a ship-for-ship engagement demonstrated appreciation of steam tactics. But there was glaring evidence that the improvisation of the Civil War was still highly regarded; for example, at the Battle of Santiago only one out of each hundred shots scored a hit! In discarding sheets and halyards, the Navy had neglected to study the revised science of warfare.

THE MODERN NAVY

The need for reform goaded a turbulent officer, William S. Sims, into indignant action. Possessed of an inquiring mind and unflagging energy Sims campaigned for better gunnery, stirring up a storm of controversy but finally selling his point. Not content, he cudgeled right and left for modern ships, properly compartmented to prevent and control damage. These crusades were so colored by Sims' forceful personality that the important point is frequently overlooked; he was not alone in his struggle. On the occasion of his marriage in 1905, gun crews of the Navy sent as a wedding gift a silver plate inscribed with the names of all the gunnery officers, surely an eloquent expression of approbation and support.

The revived movement for welding science to the Navy introduced officers to the airplane and the submarine. The Navy quickly recognized the possibilities of the flying machine; in November, 1910, a plane first flew from a ship; two months later a ship-board landing was made. At the same time several venturesome officers such as John H. Towers took to the air and became naval aviators. The submarine was also part of the Fleet and serious studies were made of its offensive powers and the need for defense against it. Chester W. Nimitz, an early submariner, wrote in 1912:

The offensive strength of a submarine lies in her ability to maneuver submerged to within easy range of a surface vessel, and then fire torpedoes without being subjected to a dangerous fire from her enemy. The surface vessel has no defense

against the submarine, except her speed in running away, and in doing this she may be running directly into the danger zone of another group of attacking submarines. The steady development of the torpedo together with the gradual improvement in the size, motive power, and speed of submarine craft of the near future will result in a most dangerous weapon.¹

When America entered World War I, the basic apparatus of modern warfare, with the exception of radar and the atom bomb, was available, even if in crude form. Yet, strangely enough, there was no technological revolution as had occurred in the Civil War. Jutland, the one great sea battle (fought before America's entry), substantiated pre-war tactical theories and the menace of the submarine had been anticipated, though not on such a threatening scale. The real pioneering of naval officers was in an unexpected wilderness, a jungle of administrative problems: organization of huge convoys, planting of immense mine fields, operation of numerous anti-submarine forces, construction of bases, training of recruits for complex duties. Like Moses when he led the tribes of Israel, the Navy divided the thousands into hundreds, and the hundreds into tens—and each element, whether tens, hundreds or thousands, was given its own commander. This released top-level leaders from administrative detail though still giving them ultimate responsibility. In this connection, Admiral Sims, commander in chief of American Naval Forces in Europe, set up headquarters ashore in his "London Flagship" and upped his staff from a mere handful to over 1,200 people. A shore-based commander of operating forces would have been unthinkable in the nineteenth century but now with radio on all ships it was feasible. Furthermore, this tremendous staff and its necessary equipment made a shore base practically obligatory. Throughout World War I the American naval officer demonstrated his resourcefulness in overcoming formidable administrative problems. Further, he displayed superior seamanship in the Atlantic convoys and the North Sea mine fields.

By the time of the Armistice, the type of

¹ "Military Value and Tactics of Modern Submarines," United States Naval Institute PROCEEDINGS, December, 1912.

officer who was to lead in the next war was fully evolved. Compare, for instance, Willis Augustus Lee, in 1918, with William Henry Allen in 1812. Most of what Lee knows would be incomprehensible to Allen. Lee is a graduate of the Naval Academy, a mariner whose seamanship concerns high-speed steam vessels, an ordnance expert, a fighter who talks of fire control and torpedo spreads, a tactician who thinks in terms of complex maneuvers by scores of ships. Lee has less combat experience as fighter and tactician than Allen for there have been no large sea battles; nevertheless his knowledge of principles is sound. Despite his specialized ordnance training, Lee considers himself the Allen combination of seaman-fighter-tactician. He is right; for too much specialization is dangerous and, in the score of years that follows, Lee charts his life course to achieve the "well rounded" career. His contemporaries do the same; Nimitz, the submariner in battleship, cruiser and staff duty; Towers, the aviator, in destroyer, carrier and staff assignments. Ernest J. King runs the gamut of destroyer, submarine, aviation and staff duties. Competition is keen and variations in professional aptitude are difficult to discern amongst these officers of common background and single purpose.

WORLD WAR II

The advent of World War II brought no sudden upheaval in the psychological environment of the line officer. Rather there were gradual changes, imperfectly perceived until after the smoke of battle had subsided.

The thousands of reserve officers who entered the Navy from civilian life, ignorant of tradition, quickly outnumbered the professionals, and their critical questioning put service usage to an acid test. Most customs stood up, but some like the mountains of "paper work" were given the "deep six." These new officers brought with them every known skill from merchandising to nuclear physics and forced into discard the service idea that a star worn above the sleeve stripe meant a deck watch-stander. One could actually answer the foolish question "when is a line officer not a line officer?" by the reply "when he's a radio engineer or a newspaper man or whatever you will." To bewilder the

old hand even further, many of these "specialist" line officers actually took command posts either afloat or ashore.

The primacy of carrier aviation brought more confusion. Line officers without wings saw with alarm the possibility of becoming vestigial ornaments. And just when there was reassurance that carrier aviation didn't mean the end of the road for all non-aviators, the atom bomb exploded and left everybody, aviators and non-aviators alike, momentarily wondering in which direction the future lay.

The necessity of freezing officers in single billets during the War was another source of concern. The "well-rounded" career looked like a thing of the past. Willy-nilly, everyone became a specialist of a sort, some in fields they recognized, others in ventures they'd never considered, such as amphibious operations. War was no time to consider the wants of each officer, yet there was no prohibition on individual worry.

On occasion, technology advanced faster than tactics, as in the Solomons where a new and very efficient search radar put in an early but far too modest appearance. In several of the rousing sea actions off Guadalcanal this radar rode aboard ships without full employment because of understandable ignorance of its value and lack of doctrine for its use.

In the field of administration, global warfare made the Navy one of the world's biggest businesses. The commander-in-chief, the area commanders, fleet commanders, district commandants, and others utilized staffs of fabulous numbers. Problems of training, coordination with industry, and biggest of all logistics, became familiar headaches to line officers.

THE NAVY VIEW

A war-time *modus operandi* kept the problems of the Line in suspension until after demobilization, but then the crying question arose, "Where do we go from here?"

The Navy Department at once began an earnest search for the solution, taking into consideration the needs of the service and the diversified backgrounds of its officers. Fortunately the ground had been well broken and a new science, "personnel lo-

gistics," already held a respected place in the Bureau of Naval Personnel. This science is a method eliminating the square peg in the round hole and by historical standards is very, very young. It started at Columbia University in 1896 when psychologists gave aptitude tests to students and was followed in France by the first "I.Q." test. In World War I, the Army and Navy tested individuals, but the questions were crude and the means for utilizing results meager. In the period between the two wars, educational institutions explored the new science assiduously but neither American industry nor the military services exploited the findings fully.

With the start of World War II, the Navy quickly adopted the latest means of scientific personnel research, analyzing each job methodically, writing a description of the job, and then investigating qualifications of each officer so as to fit man and job together. In the Bureau of Personnel was a card for each officer which listed his qualifications extensively. If it was desired to find a lieutenant who had mine-sweeping experience, had served on the Asiatic Station, and was qualified for command, qualification cards for lieutenants were placed in sorting machines which mechanically selected all those eligible. The demands of war prevented fitting man to job in many cases, but, all in all, the system was a vast improvement over the previous hit or miss selections. Since the war, the system has been overhauled, and the line officer may usually expect a billet commensurate with his talents.

The education of the line officer received official attention also. The Holloway Plan dealt at length with officer training and Rear Admiral James L. Holloway synthesized the need for professional competence in these words:

Professional competence, particularly in the role of command and in association with operations, is a *sine qua non* in the Line officer. It is of paramount importance in the senior officer operating at policy level and exercising high command involving naval and military statesmanship and important administration. This is for two funda-

mental reasons. First, professional competence, acknowledged and confirmed by continued sea or field assignments appropriate to age and rank, is required to ensure the confidence of the Service as a whole. Secondly, and closely allied with the first, sea or field experience is essential for creation of balance and a sense of values, professionally speaking. And this last, in all matters of administration and policy, must be integrated at high level, if direction and implementing measures are to be thoroughly objective.¹

To develop professional competence, the Navy sends officers to numerous schools such as the General Line School, Armed Forces Staff College, Naval War College, and National War College. Those who would specialize attend postgraduate schools and civilian colleges where they learn subjects varying from aeronautical engineering to personnel administration.

THE INDIVIDUAL VIEW

Having traced the development of the line officer from ancient days to modern and outlined what the Navy as an institution is doing to create an effective line corps, we may now utilize this knowledge to approach the crux of the matter, the line officer as an individual.

Today the officers who wear sleeve stars may be divided into three categories; the ultra-specialist, the middle roader, and the non-specialist—or "salt horse" as the British call him. The ultra-specialist is an individual who has chosen some particular field, such as meteorology or communications, as a full-time naval career. The middle-roader is an aviator, a submariner, or an officer with postgraduate training in ordnance, engineering, or some similar field; he employs his specialty but aims foremost at operational command. The salt horse has no specialty to distinguish him and, aside from attending institutions such as the Line School and the Naval War College, acquires his entire postgraduate education in ships of the Fleet.

Since a line officer may be defined as one who is or will be eligible for operational command, it is apparent that the ultra-specialist does not qualify. The Navy recognizes this as fact by placing the ultra-specialist in a "special duty only" category. However, because there is many a middle-roader and salt

¹ "The Holloway Plan—A Summary View and Commentary," United States Naval Institute PROCEEDINGS, November, 1947.

horse who will elect to become an ultra-specialist, it is necessary to answer the following question before eliminating him: Which grouping should the line officer enter?

Introspection yields the answer. If the officer believes he has outstanding capabilities for a specialty and is ardently enthused about it, he should consider becoming an ultra-specialist. He should view his own personality objectively; for instance, if he does not like executive duty, he will serve himself and the Navy better in technical duties. If, on the contrary, he is ambitious to try for the top, he must stay away from "special duty only." Competition is probably less severe for the ultra-specialist until the rank of captain but eventually the narrow limits of special duty will rule out the officer from attaining top-level command. The only exception would be if his specialty suddenly assumed tremendous operational significance as was the case with civil engineers in the Seabees during the War, who, contrary to custom, assumed military command.

The course of the middle-roader is most attractive. He holds down executive posts which give him insight into organization, training, discipline, and the over-all functions of the Navy. At the same time he unlocks a door to unlimited opportunity in a chosen specialty. Certainly such fields as aviation and guided-missile ordnance progressively increase in importance.

There are warning signs posted for the individual today who chooses to become a salt horse, an officer with no specialized training. The peril is reasoned something like this: A command vacancy in an operating force exists. If the command is one which does not require an aviator, an engineer, or some other variety of middle-roader, it will go to the best man available who may be *either* the middle-roader or the non-specialist. If the command requires some sort of middle-roader's technical knowledge, the salt horse doesn't even get in the race. With such a handicap limiting opportunity, the non-specialist must be good. There is a place for him in the Navy, a man who loves ships and is competent to deal with human problems, who can organize a snappy 10-man gun crew or a smart 8-ship destroyer squadron.

There is a second question posed by our

classification: What can an officer do to further his career, once having made a choice? This answer also requires self-examination. We may immediately dismiss the ultra-specialist as having to all intents and purposes relinquished his line officer status. Of the other two classifications, the middle-roader should strive for high efficiency in his particular forte. The word "expert" still has a magic sound, and if he acquires this exalted cognomen he can go far. On the other hand, he must be careful that enthusiasm for his specialty does not warp his judgment into thinking that there are no uses for other branches. The successful middle-roader gets around, sees how the other half lives, and thus acquires the old-fashioned "well-rounded" career. And in this respect he cannot overlook the worth of seamanship. Like Nelson, he may not become the most skilled ship handler, but he must certainly know what to expect of ships alone and in formation, for the planes and the guns of the Navy still go to war on board ships. The non-specialist salt horse likewise must establish a reputation. In his way he can become an expert destroyer man, a superlative organizer, a brilliant staff planner, or a combination of several professional qualities. It may be that he can specialize in a modest manner, becoming the most informed concerning one particular ocean area, or the authority on a particular kind of tactics, such as amphibious operations. He, most of all, must get around the Fleet. A tour of duty in a carrier will give him a valuable slant on aviation philosophy and tactics. Serving on the staff of an anti-submarine unit where he would mingle with aviators, submariners, and engineers is another example of valuable duty. It is probable that the younger salt horse will have an easier struggle than his older harness mate, since the education of midshipmen and ensigns now covers many specialties, aviation in particular.

There is more soul-searching required of both middle-roader and non-specialist. The officer who dons the uniform after reaching maturity must be circumspect in his attitude toward established military tenets. It is suicidal to reject the hard-won tactical lessons of the past. If the Athenians at Syra-

cuse had but remembered the sage counsel of Phormio years before, they would not have entered a disastrous engagement in restricted waters.

It is just as dangerous to repudiate tradition, for then discipline falters. The nineteenth century military philosopher, Colonel Ardant du Picq, declared: "Discipline is not to be had on demand, is not created overnight. It is an affair of institution, of tradition."¹ A modern example is the deterioration of discipline in the German submarine service during each of the last two wars. Both conflicts began with officers imbued with naval tradition. Attrition of these officers in combat and consequent substitution of officers without extensive military backgrounds caused disaster. Tradition was lost with the trained men and thereafter discipline cracked.

On the other hand, the officer who lives his formative years in the Navy must be careful not to accept anything blindly, must adopt a searching attitude. A look back on the formalistic warfare and ineffective tactics of the seventeenth century Tourville school will emphasize that sometimes a break with tradition is imperative.

An instance of a change in tradition is the new relationship between officer and enlisted man. In 1812 it was literally true that an officer could do any task his men could, from furling sails to shooting cannon. The tars knew this and respected the officer for it. Today, however, the enlisted man frequently has technical knowledge beyond that of the officer. A skipper does not know, and is not expected to know, how to repair the innards of a radar, but he must know the tactical use of the radar and he must earn the respect of the sailor by his own professional competence on the bridge.

Following this same thought further up the chain of command, it is apparent that flag officers must rely on the technical advice of staffs. So it becomes important for commanders to select and judge their "experts" with care. During the last war it was common to see non-flying officers with airplanes under their control and aviators giv-

ing tactical orders to destroyers in a task force. But in these cases, there were always the experts who gave the commander advice before the commander made his own responsible and considered decision. Some leaders were administrators, some were specialists, but the specialist hired administrators, the administrator hired specialists.

In coping with the challenge of readjustment in the post-war Navy, each officer's background and temperament must be considered as a separate problem. In that respect there are several measures which may be taken irrespective of whether the officer chooses to be an ultra-specialist, a middle-roader, or a salt horse.

For one thing, the individual can give the detail officer some guide as to which course he is steering. For all its admirable file system, the Bureau of Personnel cannot evaluate an officer's personal preferences without cooperation from the officer concerned. One of the most important means of doing this is to pay scrupulous attention to Sections No. Five and No. Six of the fitness report. Section No. Five requires that an officer list his preference for next duty. A perfunctory approach to this choice won't do. If an officer writes his next choice of duty as "any ship or station," he may end up in a job for which he is totally unfitted temperamentally, since the file system necessarily cannot classify human nature. An extreme case of this is an officer who declares, "I never make a request because if I did and didn't like what I got, I'd be griped at myself." Such an officer is usually the one who blames some mysterious "they" for his troubles. "They did this or they did that to me." Actually the fault is entirely his own. Preferences for next duty should be based on serious introspection. The forehanded officer remembers always that the Navy is a fighting organization and translates into his own personal sphere consideration governing his most likely function in the event of war. If war comes, it is too late to fulfill a wish to be a jet pilot, an intelligence officer, or a destroyer skipper, unless the groundwork has been laid in peacetime. A review of the careers of outstanding naval officers reveals that they knew what they wanted and said so.

Section No. Six of the fitness report is a

¹ Col. Ardant du Picq "*Etudes sur le Combat*" from Gaucher's *Study on Psychology of Troops and the Command*.

responsibility of the reporting senior and states in part: "Comment on special or outstanding qualifications as well as any physical defects which should be considered in determining the kinds of duty to which he [the officer reported on] should be detailed." No officer should be bashful about telling his commanding officer of special qualifications, either of personality or ability, which may be unknown to his commanding officer. As examples, if an officer feels that he is specially adapted to jobs wherein a predilection for personnel organization is a factor, or if he has in the previous six months acquired through study a speaking knowledge of Spanish, he should inform his commanding officer. Of course, it remains the prerogative of the reporting senior to judge and remark on whether or not the officer does actually have the qualifications, but the reporting senior can give a fair assessment only if the individual officer brings his light out from under the bushel.

The officer's data card (Navpers 340) submitted annually is another method of informing detail officers of desires and abilities. It should be treated with just as much care as the fitness report.

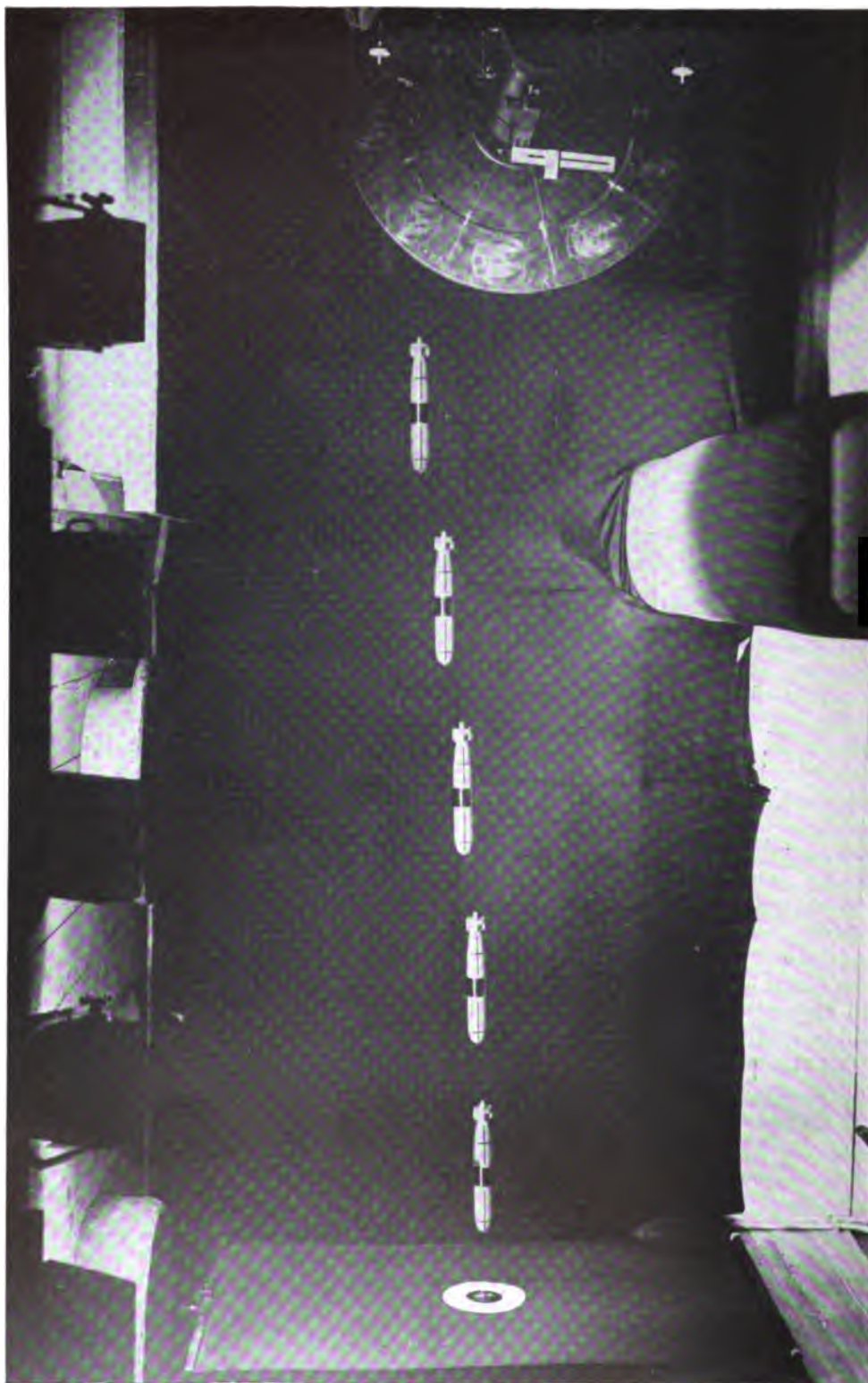
Finally, there is the special request. It is not advisable to put in a "chit" every time an assignment is distasteful; military necessity sometimes lands officers in jobs they dislike, and furthermore, a constant stream of requests not only burdens the detail officer but gives the petitioner a reputation of being a sea lawyer. But surely, if a change of duty is falling due and there is one particular billet which an officer honestly desires, a straightforward statement of what he wants and why will be appreciated and considered.

Another step which all officers can take is not really a step at all but a pause—a pause for reflection. In the report of the Holloway

Board it was stated that the General Line School should have as an aim the "exercise of thought rather than the mere acquisition of information," that there should be time for the "reflection necessary to the development of perspective." That is good advice not only for the Line School but anywhere in this hurly-burly world; advice which should be heeded by all officers whether ashore or afloat. A study of history and a lively interest in current affairs links the past with the present and provides both the exercise of thought and the development of perspective described by the Holloway Report. Only when the officer has a good grasp of both past and present, dare he project his mind intelligently into the future. Fortunate indeed are the officers who attend the General Line School, Naval War College, or the National War College, to have a full year away from administrative details and executive responsibility.

The old composite of resourceful seaman-fighter-tactician is still the goal to be sought by line officers. In the past, the relative importance of each component of this description has varied but any continued deficiency has eventually led to trouble either for individuals or for a navy as a whole. The successful line officer is resourceful in meeting the challenge of changing situations. He is a seaman in the Nelson sense, knowing what his ships—or his planes for that matter—can do, and he is able to translate this knowledge into effective action. He is a fighter with the spirit that makes men eager to follow and emulate; devoted to service and country, not as a martyr but as a man satisfied and proud in his profession. He is a tactician with ability to utilize all the resources at his command successfully; whether they be fleets, bombs, bullets, guided missiles, individuals, or facts.





Photograph Courtesy of the California Institute of Technology

STUDIES THAT MAY IMPROVE TOMORROW'S TORPEDO

Model torpedoes are hurled at varying speeds from the centrifugal launcher at the California Institute of Technology.

THE SHAPE OF TOMORROW'S TORPEDO

By WARREN HUGHES

THOUGH submarine officers and crews have come to be known as the "silent service" because of their unboastful attitude, the boats themselves are sometimes far from silent, making unwelcome noises that have nothing to do with the noise of propulsion machinery. One such noise, called cavitation, occurs when the submarine travels through the water at high speed. It would occur even if submarine engineering plants were as quiet as a greased eel. When an object travels rapidly in a liquid, cavitation occurs, resulting in the formation of water vapor bubbles which suddenly appear, expand, collapse, then mysteriously reappear and disappear once more. Because cavitation bubbles are noisy when they collapse—two walls of water smash together in less than a ten-thousandth of a second—the phenomenon may be the difference between success and failure of a submarine attack near the surface. A bubble smaller than a dime sounds like the crack of a rifle as walls of water collide. The noise is compared by some to the boom of thunder when air rushes in to fill a cavity created in the atmosphere by a bolt of lightning. Though cavitation is not a significant problem at great depth, submarine personnel have a wholesome respect for it.

Noise, however, is not the only effect of cavitation. The roiling mass of water limits the speed of underwater bodies, and, particularly important when applied to torpedoes, intensifies the problem of controlling their direction. Moreover, cavitation grinds and erodes metals subjected to its force just as rainfall honeycombs limestone, but faster. Pumps, closed conduits, or a ship's hull can be affected by its action. Nineteen-ton propellers of battleships can lose their balance because of its abrasive effect. High speed passenger liners in particular have had unfavorable experience with cavitation action on propellers. The *Maurelania* had to be dry-docked for propeller replacement or repairs after every fourth trip across the Atlantic. The *Normandie* required propeller repairs

after every round trip. Although improvements in propeller design and construction have been made since the heyday of the *Normandie*, the effect of cavitation remains a considerable problem in ship maintenance. Pump impellers subjected to its force become so worn and eroded as to look like coral heads or natural sponge.

In order to control, insofar as possible, the effects of cavitation and to learn more of other little-known factors in the field of hydrodynamics, scientists at the California Institute of Technology in Pasadena are making specialized studies under the joint sponsorship of the Navy's Bureau of Ordnance and the Office of Naval Research. Information gleaned from the studies may have a far reaching effect, not only upon naval equipment in general but upon hydraulic turbines and other industrial installations as well. Results of studies, in many instances, are being made available to industry and to other laboratories.

The California Institute of Technology has been making technical studies of water and its effect since its hydraulic structure studies were first undertaken nineteen years ago. Its first project was to build a small model of Alamos Bay to determine the best way of bringing the San Gabriel River to the ocean without disturbing existing industrial facilities which used the bay for cooling purposes. The Hydraulic Machinery Laboratory was established soon afterward to assist the Metropolitan Water District in solving its pumping problems. The laboratory succeeded in saving the District more than twenty times the cost of its research.

A GRADUATE of the University of Texas, Mr. Hughes was commissioned in the U. S. Naval Reserve in 1942 and served on the staff of Commander Service Force Pacific and in the U.S.S. *Pawnee* in the South Pacific. He later commanded the U.S.S. *Quapaw* and the *ATR-55*. He has contributed articles to many popular magazines.

The present Hydrodynamics Laboratories, under the supervision of Dr. R. T. Knapp, embrace not only the original harbor model studies and hydraulic machinery projects, but other phases of water research as well. During the war the experimental center, operating under contracts with the Office of Scientific Research and Development (OSRD), expanded further and carried out assignments with antisubmarine weapons, torpedoes, and rockets. Much experimenting was undertaken in the field of launching torpedoes from aircraft.

After the war, the Research and Development Division of the Bureau of Ordnance took over sponsorship of projects from the OSRD in order to seek out further answers to underwater ballistics problems which earlier experiments indicated would be desirable. The Fluid Mechanics Branch of the Office of Naval Research, recognizing possible applications in naval fields other than those encompassed by the Bureau of Ordnance, joined in support of the program soon afterward.

"We know a lot about what cavitation does. We can tell you what causes it, but we still don't know for certain how it works," Dr. Knapp, Director of the Hydrodynamics Laboratory, says. "It is this latter knowledge for which we are searching, for when we know that, we can begin hoping to find a cure for it. We have already discovered many things not heretofore known, and with high speed cameras and tunnels we are learning more and more about the life cycle of a cavitation bubble. We know that there are a good many different kinds of cavitation bubbles, each with some characteristics not common to any other kind. We would like to know for certain what forces are released to cause such damage to metal, and what we can do to control these forces. This is a job in fundamental research for which our water tunnels were designed and built. The research we are doing may ultimately affect the design of every machine that moves in a fluid."

The laboratory, while making studies of cavitation from conditions of incipient development to the fully developed state, investigating the effect of design on production of cavitation, and the development of cavi-

tation resistant shapes, is not limiting itself to those phases of research. Other studies investigate force systems acting on moving submerged bodies, forces acting upon bodies moving from air to water, and those acting upon submerged bodies near the surface. Still others seek out information on wave action, ship protection in harbors, and propeller action.

The California Institute of Technology Hydrodynamics Laboratory is said to be unequalled in the world. Adjoining the famed Guggenheim Aerodynamics Laboratory, the center is housed in a building with a total of 15,000 square feet of floor space available for apparatus and offices. Its equipment, unconventional in design and use, is adapted to the study of a number of problems that trouble marine architects and engineers. Most of the equipment was designed by Institute scientists and built under their supervision.

Most striking, perhaps, is a high-speed water tunnel, comparable to wind tunnels used for aerodynamic research. Study of high-speed bodies proceeding through water could be made by moving an object through stationary fluid at the desired speed, or by forcing liquid at controlled velocity past a stationary object. Relative flow would be the same in either case. The Pasadena high-speed tunnel uses fixed models, with water rushing by at speeds as high as 100 feet per second, the greatest speed ever attained by a water tunnel. Although its greatest rate of flow is equivalent to a sixty knot current, its sensitive element can control velocity in steps of one-tenth of a foot per second.

Operating a high-speed tunnel is not simply a matter of rushing water at certain speeds past an object, as one might at first assume. Variable conditions must be controlled. The working section of the high speed tunnel is only fourteen inches in diameter and six feet long. Water, however, travels 334 feet through the remainder of the circulatory system in order to get there. A 350-horsepower pump drives water through the system. Because heat from operation of the pump would cause a rise in water temperature, a refrigerating system cools the water and keeps its temperature at a constant level.

Air bubbles, released as a result of cavitation as roiling water passes the model, could

be a hindrance if allowed to make the complete circuit. Entrained air, if allowed to build up, would change the velocity of flow, alter cavitation conditions, and obscure the model in a short time. To eliminate these disadvantages, the system has a device called a "resorber" to return entrained air to solution. Essentially a divided well 58 feet deep, water is forced down one side and up the other. Pressure on the water at the bottom, combined with the time required to pass through the device, returns entrained air to the water before sending it past the model once more.

Models used in the high-speed tunnel are two inches in diameter—about the upright size of a paper match folder—and are usually made of stainless steel. Insofar as precision machines can make them, models are exact geometrical replicas of their prototypes under consideration. Made in parts, cylindrical body sections can be assembled from one-tenth to twelve inches long, in steps of one one-hundredth of an inch. Allowance is made in final calculations for the effect of supporting struts that hold models in place. For fundamental research, the high-speed tunnel is perhaps the laboratory's most valuable piece of equipment. Intricate force-measuring apparatus is attached to models to obtain information on drag, cross or lift force, and a moment about the axis normal to the direction of flow.

Because hydrodynamic forces acting on an object at or near the surface are different from those at greater depths, the Institute has a second major piece of equipment called "the free-surface tunnel." It is unique in that the stream of water in its working section is confined on only three sides; its upper boundary is a free surface where air and water meet. While the velocity of flow is slower than that of the high speed tunnel, its working section is larger. Up to thirty feet per second of water flow can be obtained in the working section, which is eight feet long by twenty inches wide. It is usually operated with nine inches of air space above twenty-one inches of water. Lucite windows the full length of the working section permit photographic and visual studies of models in operation. Air pressure above the free surface can be varied between normal and one-

twenty-fifth of normal atmospheric pressure.

While the working section combines air and water at the surface, the circulating system which rests below it is designed to eliminate all air bubbles before the water returns to the operating area. Splash and spray is led off to a stilling tank, thence back to the circulating system. A diffusion system, receiving the direct flow of the working section, takes the rushing water through four sixty-degree turns which are fitted with turning vanes to slow it to about a sixteenth of its former speed. Decelerated by this process, bubbles are removed quickly in an air separator. The separator is composed of a series of spaced trays that reduce effective depth to two inches; holes in the tray capture and release air bubbles. Air-free water is then forced by a large propeller pump back through the system.

The air-water tunnel measures simultaneously the submergence, surface wave pattern, and cavitation characteristics of variously shaped objects that it tests. Force-measuring balances are more complex than those of the high-speed tunnel.

Models used in the free-surface tunnel are of similar size to those used in the high-speed tunnel.

A third major piece of equipment is the controlled atmosphere launching tank. It is used principally for studying problems involved in free-flying objects as they enter the water. Ahead-thrown antisubmarine weapons, rockets, and torpedoes might be investigated in the tank; underwater explosions also could be studied with the equipment.

In studying problems of water entry from the air, it is sometimes necessary to control atmospheric pressure and density. The tank was built as an immense, closed cylinder thirteen feet in diameter and twenty-nine feet long. It looks like the boiler section of a gargantuan locomotive, and was designed to withstand an internal pressure of forty pounds per square inch. Empty, the tank weighs about 40 tons; filled to its usual operating depth of ten feet, it weighs 150 tons.

When ready for operation, a model is attached to a centrifugal launcher at the top of the tank. The launcher, a heavy flywheel

about thirty inches in diameter, is a real sharpshooter. Rotating rapidly with the model attached near its periphery, the launcher hurls the object into the water at speeds as high as 150 knots. Technicians sometimes demonstrate the launcher's accuracy by shooting the two-inch models through a two and one-half inch hole in a screen twenty-five feet away. "We could use a smaller hole," they say, "if we wanted to go to the trouble of positioning the screen more carefully." The mechanism launches models at any desired trajectory from directly downward to horizontal, and at any desired speed up to 250 feet per second.

Mounted in a section of a smaller cylinder attached to the main tank, high-speed motion picture cameras record the missile's path in the air and under the water. The cameras operate without shutters, depending upon repeating flash bulbs of the Edgerton type for exposures. Intermittent flashes, as many as three thousand per second, begin at the instant the model is released. Exposure time is approximately ten thousand times less than normally used in motion picture photography. Eight synchronized cameras record information; one set of three records air trajectory while the remaining cameras record underwater travel. Underwater cameras are placed behind optically ground spherical windows to eliminate distortion or reduction of the field which would result from the use of plane glass windows. To provide a dark background and avoid contamination of the water, the entire tank was lined with Koroseal, which has the added advantage of minimizing damage to models when they happen to strike tank walls. Since the local water supply contains impurities that filter out all blue and violet light, the tank uses only distilled water; otherwise insufficient light would be available for the cameras as precision measuring instruments.

A sixty per cent overlap of fields of view allows results to be analyzed by photogrammetric means. Stereoptical techniques similar to those of aerial photography reveal data on longitudinal, lateral, and vertical movement and rotation in both horizontal and vertical planes.

Models used in the launching tank must be not only geometrically precise replicas,

but also must be scaled in weight. Furthermore the center of gravity must be in the correct location and the moment of inertia must be right. Combinations of aluminum and stainless steel are sometimes used, and frequently walls of models are quite thin to allow proper scaling.

Another research instrument, and perhaps the most intriguing, is the Institute's polarized light flume, which looks like a smaller version of the free-surface tunnel. Based on principles of polarization discovered by Dr. Davis R. Dewey of Massachusetts Institute of Technology, it is possibly the only one of its kind in the world. Some other research activities have used polarized light for specific water research, but not in a tunnel.

Crystals of Bentonite, so finely divided that they look like powdered chalk, orient themselves in a standard plane when suspended in water, polarizing light that enters the mixture. Flow patterns that would be invisible to the naked eye are readily discernible when viewed through polaroid glass. "Its principal use is to find sources of trouble in designs," Professor Joseph Levy, Principal Research Engineer at the Laboratory, says. "If a given shape has too much drag, the polarized light shows its operating characteristics and reveals quickly the points of trouble."

Eyes are better than photographs for recording data from the polarized light flume. The transparent working section has a sliding polarized glass viewer for observation of specific parts of models. "Photography is difficult in the polarized channels," Professor Levy explains. "Light runs through the long path. The film records integrated effects rather than separate localized effects about the model." Calculations are usually made on the basis of graphs developed from visual observation.

The polarized tunnel could be used for hull research by X-raying, in effect, water flow patterns about the body. So far the laboratory has not undertaken hull studies, but general principles discovered from the use of other models might be applied to hull design problems. "We have studied a bit of everything about any body or shape," Dr. Knapp says. "We even tested an airplane model in the flume for observation of high

velocity points in its design."

Some models tested in the polarized channel have been fitted with operating propellers. One was driven by a two and one-half horsepower electric motor contained in the model which was no larger than a flashlight. Precision instruments and models are produced in the laboratory's own shops.

Other studies are undertaken with the ripple tank, a shallow glass-bottomed tray used for investigating wave problems. The ripple tank, which looks like a six-foot cookie sheet with a transparent bottom, has a vacuum operated wave-making machine that draws up water, then drops it to start a single wave going out. In shallow water—the device is operated with about an inch of water—the single wave goes out as a sudden change in depth. Institute scientists develop data on single wave action and combinations; scaled model waves of any desired size can be generated. Measuring devices are accurate to about one-thousandth of an inch.

The tank is operated in a dark room. A point source of light is reflected through the tray bottom by a 45-degree angle mirror. Another screen at the top reflects wave action for visual observation, or, if desired, a camera can be fitted above the tray. Both recording means are used.

They place small scale harbor models in the tray for studying wave effects. "The ease with which work can be accomplished is rather amazing," Dr. Levy says. "Let us say that we have a model of a harbor and want to know how effective a breakwater would be in a certain position. Just place a piece of stock material about the size of a pencil in the proposed location, generate some waves, and discover its general effectiveness."

The study of wave reflection is also applicable to acoustic problems, as in an auditorium, or to research in shock waves in compressible fluid. Since equations of shock waves in air are much the same as in shallow water, deductions can be made of interest to those working on explosive forces in air, flight of high speed aircraft, and missiles.

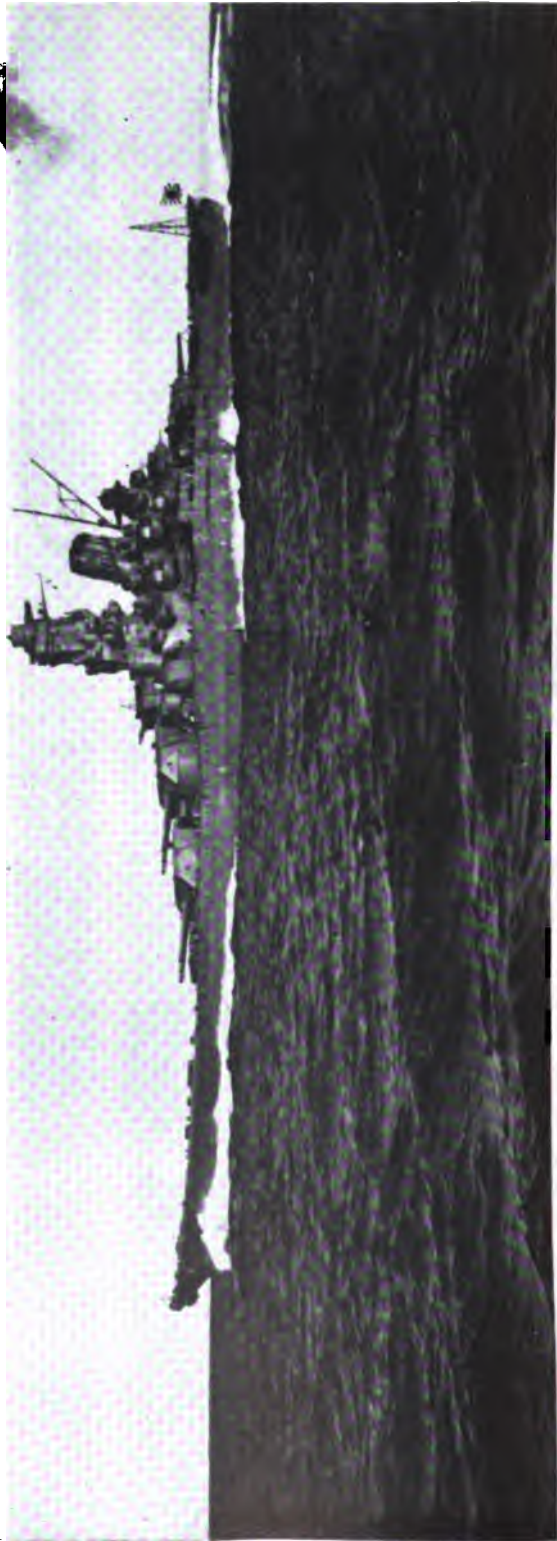
Other Institute projects in the hydrodynamic field include the widely known scale model of Apra Harbor in Guam. Sponsored by the Bureau of Yards and Docks, this

model is being used for studies prior to actual construction. It has helped solve problems of allowing ships the most protection from heavy weather, wave, and tidal action, and of erosion and storm protection for beach installations. Research work with the harbor model is still under way.

In addition to the research equipment mentioned previously, Institute engineers study rotating channels of water, as in passing the blades of a propeller or impeller. They seek to learn exactly how a fluid operates in the turbulence of being driven. They place markers in water, little globules of some other liquid that has the same specific gravity as water but is different in its refraction of light. The markers are distinct dots when light shines upon them. Then, using models of various blade types and operating them in the fluid to move the water and markers, the flow of the mixture is shown as a series of dots. High speed cameras record the flow of dots past the blades to measure the efficiency of design and flow rate.

Using the above array of scientific equipment, seventy scientists and technicians conduct practical studies assigned by the Bureau of Ordnance and the Office of Naval Research to discover means of improving ordnance and equipment that travel in water. Institute scientists evaluate not only whole designs but also each component part under various conditions of anticipated operation. Scientific findings aid designers in meeting needs of proposed equipment and in overcoming obstacles of hydrodynamic phenomena.

From the laboratory may come new ideas and discoveries that will affect tomorrow's torpedoes. The solution of water entry problems of fast moving missiles would reduce, to a large degree, broaching and erratic runs. If the greater part of cavitation's effect were overcome, the Navy's torpedoes would have more speed and better control than ever before. A more silent submarine would result. Better ship hulls might be designed on the basis of primary discoveries at the Institute. More efficient pumps, more durable propellers, and an improved propulsion system could result from the Navy's encouragement of scientific curiosity and persistence.



Official U. S. Navy Photograph

THE YAMATO, WORLD'S BIGGEST BATTLESHIP, IN A PEACEFUL MOMENT

This photograph was found in the possession of a Japanese civilian who had kept its existence a secret.

BATTLESHIP BANZAI!*

By CAPTAIN WALTER KARIG, U. S. NAVAL RESERVE (RET.), LIEUTENANT COMMANDER RUSSELL HARRIS, U. S. NAVAL RESERVE, and LIEUTENANT COMMANDER FRANK A. MANSON, U. S. NAVY

IN CHARTING his plans to protect the invasion fleet at Okinawa, in March 1945, Admiral Spruance allowed for the dubious possibility that the Japanese might try fast surface raids. So, in addition to maintaining a clock-around air watch of the sea approaches, he placed a network of submarines to guard the southern gates of the Inland Sea.

Certainly any scheme the Japanese might concoct to raid Okinawa shipping would be a desperate gamble. But Japan was in desperate straits. Camphor and pine oil, even fish oil, were being used as substitutes for petroleum. The people were mixing sawdust with their rice—red pine was deemed the tastiest! Imperial air forces by necessity had resorted to suicide. Japan was besieged, cut off from continental supplies by American submarines, her industries pounded to scorched rubble by Flying Fortresses. The end of the war was inexorably approaching.

The way of the Samurai is not to wait for the inevitable but to go forth, sword in hand, to meet it.

No one knew Japan's plight better than Admiral Soemu Toyoda, Commander in Chief of the Imperial Combined Fleets—"combined" because not enough was left of them to warrant otherwise.

Toyoda had never been optimistic about a war with the United States. He made no secret of his disgust with the Army, which he blamed for precipitating the conflict out of an inspiration composed equally of over-estimating its own strength and under-estimating America's. But Toyoda was also a loyal servant of the Emperor, and, once committed to the war, he was determined to do his best to win it, and, failing the impossible, to lose

gloriously and to make the victor pay extravagantly.

Now he knew he could not even achieve the alternative, but at least he did not have to see his fleet perish ingloriously.

He commandeered every drop of fuel oil that could be transported to Tokuyama Bay. By draining every storage tank, a respectable 2,500 tons was assembled as word came from Okinawa that the Americans were ashore.

Two thousand, five hundred tons of petroleum: The United States fleet burned more than that every hour. Toyoda made his computations. Then he rubbed his brush on the ink-cake, and carefully, thoughtfully, wrote a directive.

At 3 P.M., April 5, 1945, recently promoted Vice Admiral Seiichi Ito, I.J.N., received Dispatch Order No. 607 from Cinc Com-

AFTER a successful career as a Washington and foreign correspondent for magazines and newspapers, Captain Karig joined the Naval Reserve in 1942. The author of numerous novels in addition to the previous volumes of the *Battle Report* series, he is at present on duty in the Office of the Chief of Naval Operations, Navy Department, Washington, D. C.

A native of Arkansas, Lieutenant Commander Harris graduated from the University of Notre Dame in June, 1941, and two weeks later plunged into naval life at the Reserve Midshipman's School, Northwestern University. Then followed Panama, sea duty, Stateside assignments, and more sea duty in the order named. In Washington after the war he collaborated on the fourth and fifth volumes of *Battle Reports*.

Lieutenant Commander Manson graduated from Northeastern State College, Oklahoma, in 1941, and taught in high school prior to reporting to Cornell University for Naval training. He served on the staff of ComDeslant and later was Communications Officer of the kamikazed destroyer *Laffey* in the Pacific. He, too, collaborated on both volumes four and five of *Battle Reports*.

* From *Victory in the Pacific*, Volume Five of the *Battle Report* series, to be published in December, 1949, by Rinehart & Co., New York, N. Y. Printed in advance by special permission of the publishers.

bined Fleet Admiral Toyoda. Admiral Ito, relaxing in his cabin aboard his flagship *Yamato* swinging at anchor in Tokuyama Bay, had, as was his afternoon custom, just sent a steward for a cup of tea. Calmly Ito moved his black-rimmed bifocals closer to his eyes and read the message handed to him by a radioman.

The message was short:

Operation "Ten-Ichi"

The First Diversion Attack Force will sortie from the Inland Sea, on 6 April 1945, and carry out a surface attack on United States Forces at Okinawa. The attack is scheduled at dawn, 8 April."

Ito read the message again to make sure of the schedule, handed it to the radioman for staff routing, and relaxed again for a moment to sip his tea and think about the past, feeling reasonably certain that his future was fairly well set forth in the dispatch.

Ito had lived a full life. Some 30 years in the Imperial Japanese Navy had enabled him to travel extensively, know many people, and know something about the world, too. He was in full accord with his boss, Toyoda, that the Japanese Navy should never have tackled the United States Navy in the first place. Now it was his duty to tackle the United States Navy in the last place, and he wryly murmured an ancient adage: "Do not uncover the teapot and release the typhoon."

He switched on his radio for a 4 P.M. Tokyo news summary, only to hear fabulous claims of Japanese successes at Okinawa.

"Sa-a-a!" said Ito, with a sigh, as he gulped down what remained of his tea, and summoned his aides for conference.

For "Ten-Ichi" operation, Ito had 9 ships: his flagship, the *Yamato*, the light cruiser *Yahagi*, and eight destroyers, *Fuyutsuki*, *Suzutsuki*, *Isokaze*, *Hamakaze*, *Yukikaze*, *Asashimo*, *Hatsusimo*, and *Kasumi*. He could have had more surface ships had there been more fuel. Nine ships weren't sufficient for even a successful suicide mission; Ito knew that, but he would do his best.

A suicide mission for *Yamato*—Ito tried but couldn't fully comprehend that assignment. The 67,500-ton monster with its batteries of 18.1-inch guns was the biggest warship ever built—and Japan had built it

secretly, at that. It was to be the symbol of Japan's supremacy, not only on the sea, but over the races of mankind.

For not only was the *Yamato* the pride of the Imperial Fleet, she was the bearer of the name held sacred as the original name of the Japanese people. When the gods separated the land from the waters, the first soil they shaped was the ancient province of Yamato, from which the early people took their names. If the ship was lost in the forthcoming battle, more than a symbol of sea power would be destroyed, more than the material physical strength of Japan would be depleted.

By April 6, the *Yamato* had fueled to 90% capacity. She had taken aboard a full load of ammunition, including fuzed AA projectiles for 18.1-inch guns, one burst from which should disintegrate an enemy plane 20 miles away. She had a veteran crew of nearly 2,500 officers and men whose morale was high, despite the gloomy war picture.

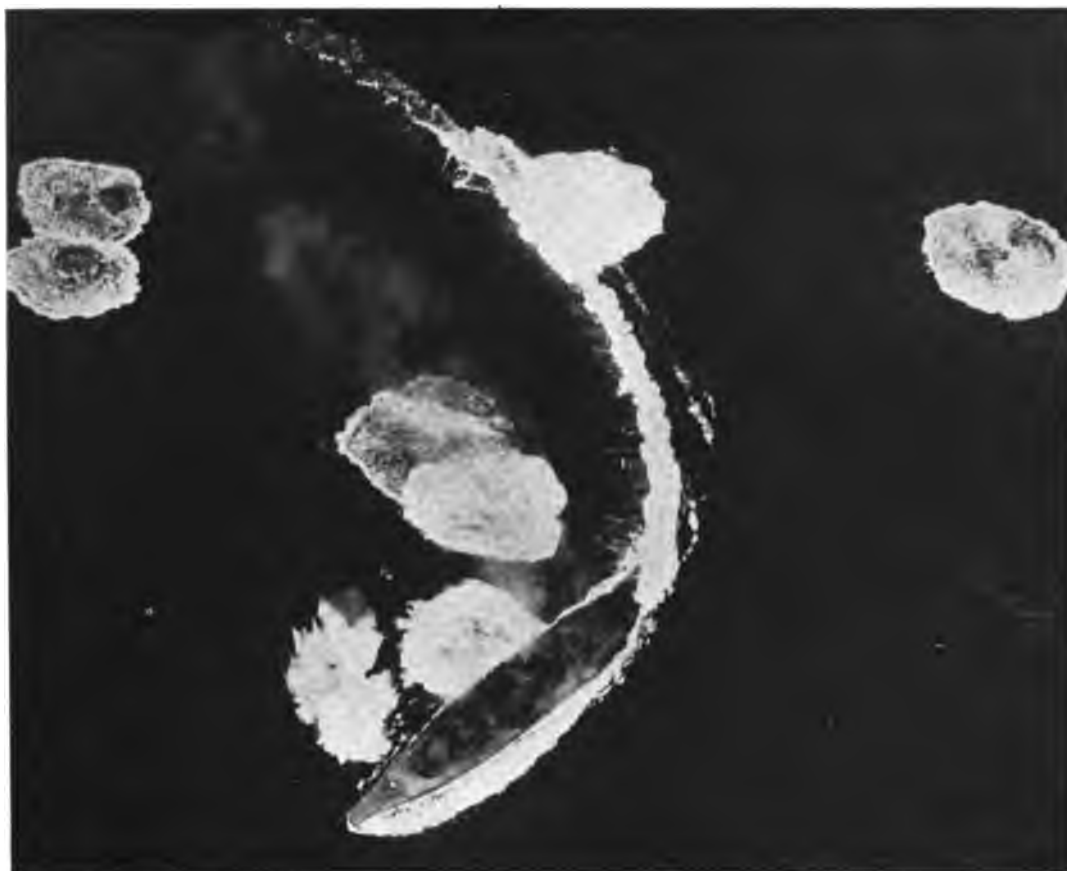
After having lit off boilers shortly before noon, Ito's squadron steamed out of Tokuyama Harbor into the Inland Sea, Okinawa bound. It was 3:20 P.M., April 6. Hardly were they underway when, according to Commander T. Miyamoto, a survivor from Admiral Ito's staff, a group of B-29's winged over high, too high to notice any activity in the Inland Sea.

The ships steamed south through the Bungo Channel, east of Kyushu, undetected. Undetected, that is, for a total of three hours. Then two alert U. S. submarines, the *Threadfin* and *Hackleback* on guard duty for Admiral Spruance, made visual contact.

"At least one battleship . . . supporting destroyers . . . course one nine zero," was the warning they flashed south.

Ito's force, alert itself, intercepted the submarine's coded radio report. The Japanese weren't sure of the contents, but had a good idea. Nevertheless, on with the mission!

Spruance was satisfied that the Japanese intended to raid Okinawa, and decided to let them steam southward before attacking—sufficiently southward, at least, to nab them before they could possibly retreat into the Inland Sea. Then he had a second thought.



Official U. S. Navy Photograph

PRELUDE TO SINKING

The *Yamato*, world's biggest battleship, maneuvers violently to avoid bombs dropped by U. S. Navy carrier planes during a raid on the Jap naval base on Kure Bay, March 19, 1945. The *Yamato* escaped this time, but was sunk by carrier planes three weeks later in the East China Sea.

Suppose the enemy might not be heading for Okinawa, but rather the naval base at Sasebo on Kyushu's west coast? Time was wasting. Begin the search!

Forty fighter planes, in units of four, roared off the fast carriers' decks during morning twilight of April 7, to search a wide, pie-slice quadrant, covering any possible course that the enemy might have chosen during the night. In order to move TF 58's air strips closer to the enemy, the carriers had turned northeastward about 4 A.M., an hour before the search was launched.

Ito was heading as straight for Okinawa as the volcanic peaks of the Ryukyus and the general operating area of Task Force 58

would permit. He had passed through Bungo Strait about dusk. At 6:00 P.M. one-third of the *Yamato's* crew was sent to battle stations while the remainder slept nearby. The night passed uneventfully, and a speed of 20 knots was maintained.

On the morning of the 7th breakfast was completed in all the Japanese ships by 7:00 A.M. Three hours later, the first uncertain radar contact was made with U. S. planes.

Ito ordered all ships to prepare to go to general quarters. Not an instant too soon, either. A few minutes later U. S. PBM's were actually sighted. Ito sounded general quarters.

The *Yamato* was buttoned up completely,

all doors, hatches, and ventilation closures tightly shut. Even the escape scuttles in the lower portion of the vertical watertight doors, a characteristic on all Japanese warships, were tightly dogged. It took her repair parties 7 minutes to get set for battle, but the *Yamato* was now ready in every respect.

All of Ito's ships were ready for action—as ready as they could get without air cover. They never had more than five land-based planes for cover—none after 10 in the morning.

Whether the Japanese intended to fight, feint, or retire made little difference to Admiral Spruance now.

An *Essex* hellcat had found them within range. It was 8:22 A.M. "One *Yamato*-class battleship, one or two cruisers and eight destroyers . . ."

"Pilots, man your planes!"

Avengers, loaded with torpedoes; Hell-divers with semi-armor-piercing bombs, and fighters with 500-pound bombs took off at 10:00 A.M. The entire striking force of Task Group 58.1 and 58.3 was aloft. Task Group 58.4 followed 45 minutes later. In all 386 planes streaked northward.

"But," said a bewildered British observer, "you have launched before you can possibly be sure of their location."

Quick to reply, Commodore Arleigh Burke of Mitscher's staff said, "We are taking a chance; we are launching against the spot where we would be if we were the *Yamato*."

Ito's ships were kept under constant observation all morning long by U. S. Kerama Retto-based PBM's. So annoyed was Ito that he opened fire with main and auxiliary batteries on the pestering, awkward-looking flying boats. Unimpressed, the PBM's merely ducked into a cloud and waited for Ito to pipe down, which he did in less than a minute. He had to save ammunition for ships later, if not Grummans sooner. *If not Grummans sooner* was right!

Planes from two task groups of 58 were closing fast. One of their pilots tells what happened:

"It was a dull flight, and as usual, nothing to do. I smoked and then smoked some more; chewed a couple of packages of gum and

finally began to count planes. We were in such a compact formation that it was easy . . . 50, 75 . . . 150 . . . 200 . . . 250 and I quit counting. It wasn't safe. I had just turned to count the planes to my right and saw an F4U (Corsair) spin dizzily out of a cloud, his tail assembly clipped away by collision. I quit counting.

"We looked like a giant crop of blackbirds hunting for Farmer Ito's granary. The hunting got tougher and tougher. Rain and more rain. Clouds and more clouds. At last one of the bomber pilots radioed, 'I've got 'em on my radar.' That would have been a great help had we been attacking by radar, but we weren't. Eventually it was like swimming through soup, we couldn't see a thing, not even the formation in front of us.

"Then another bomber pilot radioed, 'I'm over the target location, where are the Japs?'

"That was the last communication that I remember. Slowly our radios had developed a whining sound, which grew worse and worse until they were like fire sirens fastened to our heads. Now we could neither see nor hear! It was like a football game of the deaf and blind. The Japanese had jammed our voice communications. Our Air Group Coordinator was helpless. He couldn't coordinate anything. He couldn't see or hear.

"There was a sudden eruption of AA close ahead. Then we knew we had found them and, because of their bursts, we knew where they were.

"Naturally we scattered, to begin the most confusing air-sea battle of all time. The Japanese gunnery officers were handicapped because they didn't have the slightest idea from where the next attack would develop. Nor did we, the attackers, for that matter.

"Our training instructions—to dive steeply from 10,000 feet or higher—proved useless. Here the ceiling was only 3,000 feet, with rain squalls all around. Bomber pilots pushed over in all sorts of crazy dives, fighter pilots used every maneuver in the book, torpedo pilots stuck their necks all the way out, dropped right down on the surface and delivered their parcels so near the ships that many of them missed the ships' superstructures by inches.

"The Japanese ships squirmed like a nest

Battleship Banzai!



U. S. Navy Photograph

RUNNING THE GAUNTLET OF CARRIER PLANE BOMBS

The *Yamato*, 67,500-ton monster, smokes amidships from several direct hits just before she was sunk in the East China Sea, April 7, 1945.

akes. The light cruiser skipper steamed ageously away from the main body, in a erate attempt to divert the attackers in lirection—away from the beloved *Ya*. He succeeded in getting himself extiously knocked out.”

ie group of torpedo planes scored several on one side of the great Japanese battle- causing her to list heavily to port. 1, a few moments later, planes from the site side scored equally as many hits, the resulting heel to starboard put her on an even keel once more. It is doubt- f damage control officers aboard the *ato* could have done as well.

ract assessment of damage was impossi- as the first air groups pulled away; the

Yamato and *Yahagi* were heavi- destroyers were positively sunk.

To the *Yamato*, as survivors la- the first strike came in two big- first scored four bomb hits in the number three turret, just aft of and two or three torpedo hits c- side. The bombs started a fire never extinguished.

The second wave of planes sco- four torpedo hits, three to port the starboard. The *Yamato* took list to port, which required coun- of all remaining starboard void speed was reduced from 28 knots than 18.

When the second strike—T

58.4's 48 Hellcats, 25 Helldivers, and 53 Avengers—arrived about an hour after the first strike, the *Yamato* was still shooting and still fighting mad. The cruiser *Yahagi* had no way on, and was spewing what remained of her precious oil. One of the destroyers burned fiercely and was trailing oil.

Greatly reduced anti-aircraft fire met the second strike. The weather had become worse but voice communications were improved, since most the Japanese radio counter-measures had been silenced.

The *Yahagi*, which had chosen to fight alone, was first to be pulverized. After taking at least a dozen bombs and nearly as many torpedoes, she gave up and went down at 2:05 P.M., after 105 minutes of fighting.

How much punishment could the *Yamato*

take? Air Group 10, from the U. S. Carrier *Intrepid*, swarmed in, connecting with at least one torpedo and eight bombs. The *Yamato* reeled under the impact, zigged wildly, cutting crazy patterns in the debris covered water. Then came the final blow—six *Yorktown* "torpeckers."

The Commander of Torpedo Squadron 9, leading the attack, took a quick estimate of the situation. The *Yamato* was listed heavily to port. Her massive armor belt on the starboard side could be seen high out of the water, exposing her more vulnerable underbelly.

"Hit her in the belly—now!"

As he brought his sextet around to the *Yamato's* high side, the starboard, he instructed all pilots and crewmen: "Lower



Official U. S. Navy Photograph

DEATH THROES OF THE MIGHTY YAMATO

When that cloud and smoke pillar blew away, nothing was left of the world's largest battleship. She was sunk by U. S. Navy carrier planes in the East China Sea, April 7, 1945.

torpedo depth setting from 10 to 20 feet."

Enemy radars were so cluttered with milling fighters and bombers that the "torpeckers" sped in undetected; their props cutting ripples in the water. All six planes made perfect runs; so did at least five of the torpedoes.

Her bottom ripped out, pushed over by the tremendous force of the underwater explosions, the *Yamato* slowly rolled on her beam ends. Billowing sheets of steam, flame, and spray veiled her departure as completely as the yellow curtain of Japanese security had veiled her commissioning ceremonies December 17, 1941, in the Kure Navy Yard.

The mighty *Yamato* had lived 6 months longer than her sister ship *Musashi*, lost in the Battle for Leyte Gulf. Her career had been active, if not successful. She had survived a torpedo from the U. S. submarine *Skate*, north of Truk in December 1943, and three bomb hits in the Battle for Leyte Gulf.

Nearly all aboard the *Yamato* went down with her, among them Vice Admiral Ito. His Chief of Staff, who had been standing on the eighth level of the pagoda tower, was trapped and carried several feet beneath the surface, where he lost consciousness. He later bobbed to the surface, was picked up by the destroyer *Fututsuki*, and was one of the 280 who survived.

But the fight had not ended, according to the battle log of Japan's Second Destroyer Squadron, although the rest must be considered somewhat anti-climatic:

1417: *Yamato* blew up and sank.

1430: *Suzutsuki* burning.

1440: Enemy planes left after strafing survivors of *Yahagi* and *Hamakaze*.

1450: *Fututsuki*, *Hatsushimo*, and *Yukikaze* started to pick up survivors.

1505: Two enemy PBM's searching for and picking up fallen enemy flying personnel.

1524: *Fuyutsuki* firing at PBM.

1657: *Kasumi* sunk.

2240: *Isokaze* scuttled (unable to make further retreat).

The log for the next day, April 8, finished the laconic Japanese version of the battle.

0845: *Fuyutsuki* arrived Sasebo, Japan.

1000: *Hatsushimo* and *Yukikaze* arrived Sasebo Japan.

1430: *Susutsuki* arrived Sasebo, entered Drydock No. 7, badly damaged.

Battle Results: At least 19 U. S. planes shot down. *Yamato*, *Yahagi*, *Isokaze*, *Kasumi* and *Hamakaze* sunk. *Asashimo* not heard from, probably sunk.

The damage estimated done to "the enemy" was a little over-optimistic, as is usually the case, regardless of which side makes the claims. Of the 386 U. S. planes participating, four dive bombers, three torpedo planes, and three fighters were shot down, from which all but four pilots and eight crewmen were rescued.

Thus the curtain was closed on the last surface action for the Japanese fleet in World War II, the tragic finale of Japan's bid for control of the western seas. What once was the third mightiest fleet in the world, had been reduced in less than three and a half years to a few pitiful remnants, all anchored in home waters awaiting the executioner's axe. It was not long in coming. Allied carriers soon closed in, their planes blasting the ships relentlessly until Armistice Day brought an end to hostilities.



"NO LIGHTS, NO SEE"

Contributed by MR. HARRY C. TAYLOR

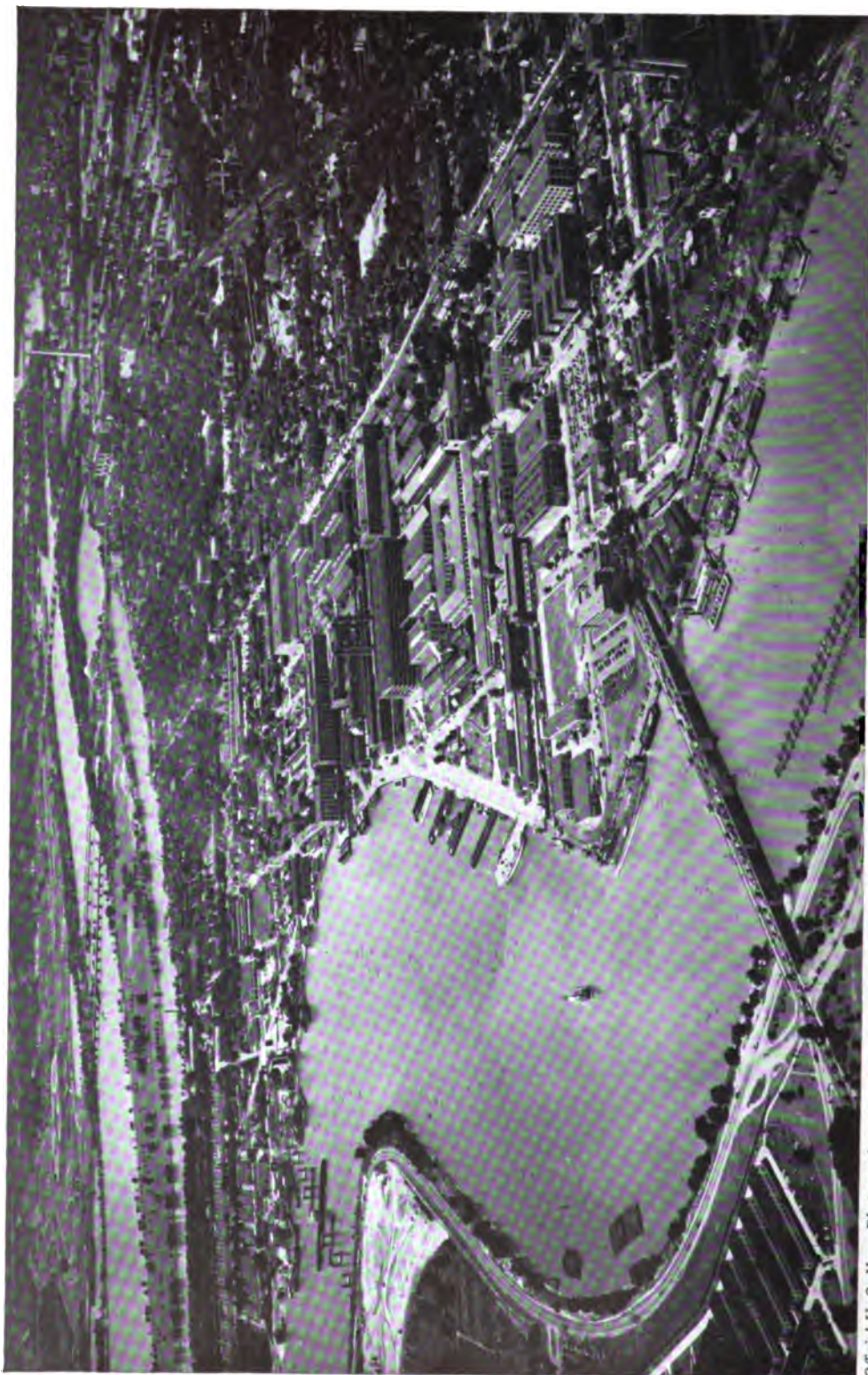
During the war, I served in the Armed Guard as a signalman on merchant ships. At this particular time, I was on a troop transport sailing to Alaska. We changed crews and among them was a boy from the Ozark Mountains who had never been to sea before. He was standing lookout on the bridge and when it grew dark, he walked over to where I was standing and said,

"When are we going to stop?"

"Why should we stop?" I asked him. "We just started this morning."

"Well," he replied, "we don't have any lights, and we can't see where we are going."

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS.)



Official U. S. Navy Photograph

THE U. S. NAVAL GUN FACTORY, WASHINGTON, D. C.

This enormous industrial plant, the greatest naval armament plant in the world, is a long way removed from the few buildings and marshy acres of the nation's first navy yard.

ROUND-SHOT TO ROCKETS

The Story of the Washington Navy Yard and Naval Gun Factory

By LIEUTENANT COMMANDER HARRY C. ALLENDORFER, *U. S. Navy*

DID YOU realize that the world's largest naval armament plant is the United States Naval Gun Factory, located a scant twelve blocks southeast of the Nation's Capitol in Washington, D. C.? Very few people do. Nor are many people today aware of the importance of this sprawling 125-acre establishment on the banks of the Anacostia River. In this day of atomic bombs, super-submarines, jet aircraft, and guided missiles, this is most understandable, for the popular trend of thought, right or wrong, is most certainly away from guns as such. It is quite natural, then, that an establishment with the name "Gun Factory" should be considered to be obsolescent by the uninformed. The truth of the matter is that the Gun Factory today is far from being a gun factory alone. The potential for making all sizes of big guns still exists, and ultramodern rapid fire anti-aircraft machine guns are being turned out on a mass production basis, but the plant does not stop there. The latest in aircraft armament for the newest airplanes, guided missile components, rocket launchers, and electronic equipment are but a few of the new types which are now familiar sights on the plant's drawing boards and production lines. The weapons of the New Navy have progressed far beyond the ball and shot stage, and the Gun Factory has kept up with the pace.

It is probably this fact more than any other which makes the Gun Factory the great institution it is today. Nearly ten thousand engineers, scientists, artisans, and clerks combine one hundred and fifty years of "know-how" with the most up-to-date industrial equipment to develop and produce the finest naval ordnance in the world.

On a par with the "know-how" which has developed through the years, and just as

important, is the tradition and history which has become an integral part of the plant and its products. Occurring as it did in the shadow of the Nation's Capitol, the history of the Navy Yard and the Gun Factory could not help being intimately attached to that of the nation itself.

Early in 1798 the ire of the young Republic was aroused by lawless and harsh depredations on American sea commerce by the ships of the warring European nations, France in particular. To remedy the situation, President John Adams and Congress set about taking the necessary steps to provide for a Navy to protect American ships at sea.

Early in the planning for the new Navy it was realized that at least one navy yard was necessary if a fleet of the required size was to be created. Naval construction during and immediately following the Revolution had been done by private shipyards, but these yards had not proved themselves capable of rapid and efficient building of even the early 44-gun frigates. In every case it had been necessary to extend the facilities of the small private yards at considerable government expense. Since the plans of the Navy De-

GRADUATING WITH his Naval Academy class ahead of time only short days after Pearl Harbor, Lieutenant Commander Allendorfer has had a career largely concerned with ordnance and gunnery. His wartime service on the U.S.S. *Wichita* took him into every theater of war, including the climax of Okinawa. Subsequently he was Operations Officer of Task Force 55, the Navy's occupying force in Japan, and still later he was Assistant Operations Officer for the target task group in the atom bomb tests at Bikini. At present he is Public Information Officer and Aide to the Superintendent, U. S. Naval Gun Factory, Washington, D. C.

partment called for the construction of vessels as large as 74-gun ships-of-the-line, it was apparent that the establishment of adequate government yards was in order and essential.

The task of taking the initial steps to found the first navy yard fell to Benjamin Stoddert, the first Secretary of the Navy. A native of Georgetown, D. C., Stoddert was a merchant, shipper, banker, and one of the original proprietors of the City of Washington. With this background, it is natural that he should have decided to place the first of the navy yards at Washington. In explaining his reason for selection of this site, he wrote: "No place farther south will admit of the same degree of security against the enemy. No place to the northward or eastward will afford timber so good, so cheap, or in such abundance. I might add all other materials for building and arming ships."

He also stated that he considered it desirable for the principal navy yard to be "under the eye of the government." In this connection it is interesting to note that today the Gun Factory is considered to be a "field activity" of the Navy and not at the "seat of the government."

Stoddert was backed up in his selection of a site by no less than General Washington himself. Washington agreed that a yard should be situated at Washington for the building of naval vessels. General Washington's keen foresight was displayed once again in his noting of the fact that the depth of the Anacostia and Potomac Rivers would always be a limiting factor to a Washington yard. With this in mind, he recommended that a naval arsenal be located below the shallow portions of the river so that ships built in the yard could be floated to deeper water before loading down with armament and ammunition. Today, when emphasis on unification is foremost in military minds, it is interesting to note the active interest that General Washington, a retired Army officer, displayed in the establishment of the Navy Yard.

On October 2, 1799, negotiations for the initial tracts of land were completed and the Navy Yard came into being. On October 2 of this year, 1949, a century and a half later, the Yard is still functioning, under a different name and with a different primary mission,

it is true, but still retaining many of its original buildings and much of its early form.

Captain Thomas Tingey was selected to be the first Commandant of the new Navy Yard. This selection was made because, as Stoddert put it, he was "an officer of great merit in our service." In addition to having an excellent service reputation, he had seen and inspected Navy Yards in England.

Tingey's tour of duty as Commandant of the Yard was a colorful one, full of interesting fact and fascinating legend. His record of length of time in one billet has probably not been broken to this day, for he was Commandant for twenty-nine years. It is said that he held the position for so long that on his death he willed the Commandant's Quarters in the Yard to his heirs. Legend also has it that for many years Tingey's ghost was frequently seen at the windows of the Commandant's Quarters and in the streets of the Yard, wearing a cocked hat and sword over a long flannel nightshirt and carrying a long brass spyglass under its arm. At midnight on December 1, 1945 when the name Washington Navy Yard was officially changed to United States Naval Gun Factory, this ghost vanished with a cry that was heard for miles around.

In the affairs of the new government the Navy Yard occupied a prominent and important position. Accordingly, Tingey, as Commandant, was high in both official and social life of the Capital. An account from the society page of the July 6, 1801, issue of the newspaper, *National Intelligencer*, is typical of social entertainment of the day:

On Saturday our Great National Day was celebrated here with patriotic and rational animation. The dawn of day was announced by a salute from the frigates, and during it ordinary business was universally suspended . . .

During the dinner, and until the company separated, a full band of music, detached from Col. Burrows's Corps, played patriotic and festive airs, and each toast was announced by a discharge of artillery, returned from one of the frigates . . .

Capt. Tingey then sang, with happy animation, a patriotic song, composed for the occasion by Mr. Law, which was received with loud plaudits . . .

The remainder of the day was enlivened by the cheerful circulation of the glass, by an excellent selection of instrumental music and by

animating songs from different citizens; when, at an early hour, the company retired in perfect good humour and sobriety.

Tingey's tour was, however, far from being all party and play. In fact, accounts of the early years of the nineteenth century might well have been taken from the newspapers of today for the trying times of reorganization and reduction through which the Navy is now passing might well have been blue-printed from the happenings of Tingey's day. When the undeclared war with France was ended in September, 1800, economy through naval and military decreases became a favorite topic of the day. "The wild men of the West," as Tingey called the more vocal followers of Thomas Jefferson, demanded immediate reduction of the military. Placing the Navy on a peacetime footing was wisely undertaken by Secretary Stoddert. His report to the Naval Committee of the House of Representatives in January, 1801, recommended the sale of all vessels except thirteen frigates, seven of which were to be laid up in reserve.

Congress heeded these recommendations and made them law. However, the day after this law was passed Thomas Jefferson was inaugurated President, and the Federalist Government was displaced by the Republicans, whose attitude towards the Navy was quite different. Because the Naval Authorization Act left a considerable amount of discretionary authority to the President, the fate of the Navy was largely in Jefferson's hands. He might well have interpreted the Navy out of existence, the way the law was written. Fortunately, however, he felt that a Navy was the single type of force a republic might possess or employ. The law provided for only a limited number of officers. Only nine out of twenty-eight captains were supposed to be retained, but Jefferson kept thirteen.

This being the President's point of view as regards the ships and officers of the Navy, those in the government with different opinions turned to the shore establishment to effect their economy. Albert Gallatin, Secretary of the Treasury, who led this school of thought, vigorously sought to have the number of yards reduced. Republican edi-

torialists called the Washington Navy Yard an "establishment of monarchical waste and sink of corruption." President Jefferson, however, was not swayed for he thoroughly believed and stated that: "a power to provide and maintain a navy, is a power to provide recepticals (*sic*) for it, and places to cover and preserve it."

Then, as now, the preservation of ships in inactive reserve was a problem. Interestingly enough, President Jefferson's inventive mind became interested and took on the project of developing an effective means of preserving inactive ships. He discovered that expenses involved in repair and renewal of gear on an idle ship in a harbor amounted to the original cost of the vessel after ten or twelve years. He also learned that the Venetians had preserved vessels perfectly for as long as eighty years by placing the craft in docks kept dry by continuous pumping. These docks, however, were expensive to construct and to keep dry, and were practical only where high tides were found. It was Jefferson's idea to place the ships in a drydock above the level of the tide where water would be accessible only through a lock which could be filled by means of a natural stream.

It was this type of drydock which was finally built at the Yard. Other problems of putting ships in "zippers" or "mothballs" were amazingly similar to those encountered after World War II. Who is to be responsible for the ships? How many and what kind of inspections of them should be made? How much gear should be removed from them and where should it be stored? The majority of these problems were solved then, however, as after World War II, by careful planning and organization by the farsighted officers charged with the task.

Another section of the Yard's early history which might well have been taken from the pages of today's newspapers is the affair of Lieutenant John Cassin, Second in Command of the Yard. In 1808, when economy was still the watchword, a new act was passed in Congress revising allowances and subsistence expenses provided officers at shore stations. On the subject of light and fuel, however, this act was not clear, so Lieutenant Cassin interpreted it to his own advantage and began to use firewood and

candles from the Yard supplies for his quarters. Within a short time he was charged with misappropriation of government property and was front page news in the Capital newspapers. A court of inquiry, however, found him not guilty and ruled that his interpretation of the law was correct.

Still another incident of the time which smacks of the present, in form at least, was the Yard's first labor management difficulty. For some time it had been the practice among the workmen to send men or boys out into town several times a day to bring in rum or whiskey to give them a "lift" at work. This had always been done with official sanction; but with economy being the key note, the Commandant ordered this practice stopped on the grounds that such procurement errands resulted in too much loss of time and labor to the Navy. The workmen promptly sent a protest to the Secretary of the Navy, complaining that they were not permitted to have refreshments while at work. As a result, a compromise was reached and the "refreshment" was allowed to be brought in during the morning and noon rest periods.

With the declaration of the War of 1812, the early problems of Tingey were dwarfed, for the Yard became not only the number one defense establishment but actually the locale of much of the War's action. The attack on Washington in 1814 of course led this list. In the early stages of the battle the Cabinet held an unprecedented and historic meeting in General Winder's headquarters in the Yard, the only time the Cabinet has met outside the Capitol in the history of the Country.

When the British applied the torch to the Capitol and White House, the momentous decision was made to burn the Navy Yard to prevent it from falling into British hands. In the resulting conflagration all the buildings except the Officers' Quarters were burned. Damage to the Yard was estimated at \$417,745.73.

After the War of 1812 the Yard never regained its original position as the most important of our navy yards. It was apparent by then that yards located on deep water, easily accessible to the sea, were more advantageous in servicing a fleet. Because of this the emphasis gradually shifted from

shipbuilding to ordnance production, and the great armament plant of today began to come into being.

This shift of emphasis, however, did not lessen the interest of the history of the Yard nor did it divorce it from its natural position of intimacy with the history of the Nation. Ordnance development and manufacture is of course the most important feature of the history, though probably not the most interesting to the non-professional.

Earliest of this ordnance development was the research and testing that was done at the Navy Yard by Robert Fulton when he was perfecting his clockwork torpedo in 1810.

Foremost in ordnance development was, of course, John A. Dahlgren. His program of experimentation at Washington became the principal factor in ultimate determination of the specialized character of the Navy Yard. In 1847 Dahlgren went to Washington to take charge of the manufacture of Hale's rockets. This began the ordnance activity which subsequently led to his revolutionizing naval gunnery with the development of the rifled gun, the principle of which is still in use today. His experimentation was not always without incident nor was the going always smooth. In 1849, for instance, he narrowly escaped death when a 32-pounder of the experimental battery exploded and killed the gunner standing in front of him. The difficulties and losses experienced, however, proved to be for a good cause in the years that followed as the United States Fleets, armed with Dahlgren type guns, swept all opposition from the seas.

Today ordnance development and experimentation still continues at the Yard—now the Gun Factory—though the specifications are radically different from those towards which Dahlgren worked. Now the development is aimed at producing rapid firing machine guns with which to arm the latest jet aircraft. Also on development schedules are anti-aircraft and anti-missile guns for shipboard use, depth charge projectors for anti-submarine use, rocket launchers for both aircraft and surface ships, and dozens of other new types of a similar nature.

Technical development at the Yard has not been confined to ordnance alone. The first ship model testing basin was built there

under the direction of David W. Taylor, later a rear admiral, in 1898. This basin was one of the finest of its kind and had features which were superior to all other existing basins in the world. Although primarily built for the Navy, it was made available to and was used by commercial shipbuilders in designing hulls and determining power requirements. This basin was the center of all test work until the David W. Taylor Model Basin was constructed during World War II at Carderock, Maryland.

Another important associated development activity was the Navy Yard's wind tunnel, which was one of the first of its kind to be built. It was in this tunnel that some of the earliest naval aircraft designs were developed.

During World War I, which of course was not primarily a naval war, the versatile Gun Factory did an outstanding job in designing and building a landgoing battleship battery. This was, of course, the battery of five 14-inch railway guns produced at the Gun Factory. These monster rifles, each mounted on a railway car, with a locomotive, kitchen car, three berthing cars, three workshop cars, a construction car, a headquarters car, and a sand and log car in attendance, were manned by naval crews and were originally conceived as an answer to the German "Big Bertha" which had bombarded Paris at inconceivable ranges.

Most remarkable part of the undertaking was the speed with which the project was completed. The first mount was on its way to France via the test ground at Sandy Hook just one hundred and twenty days from the beginning of the first design.

Firing at ranges up to 35,000 yards, the five guns fired a total of seven hundred and eighty-two rounds against the enemy with an accuracy that astonished everyone and wreaked havoc with the German installations. Unique in the project, too, is the fact that this was the first and probably the only time that a naval officer commanded the largest pieces of "field artillery" possessed by a land army of millions. This was most certainly effective "unification" in its most practical form.

More interesting, perhaps, than the technical history of the Navy Yard and Gun

Factory are the many historic events which have occurred at the Yard by virtue of its proximity to the Nation's Capitol. One of the earliest of these interesting historic sidelights was the landing at the Yard waterfront on May 14, 1860, of the first Japanese Embassy to the United States. The Japanese had made the trip to Washington aboard the steamer *Philadelphia*. In an impressive ceremony, under the flag of the rising sun waving from the wharf flag pole and flanked by a company of groomed and polished Marines, the Embassy delegation, with the Treaty in an ornate box suspended on a pole between the shoulders of two officers, was welcomed to the United States by Captain Buchanan and the Mayor of Washington.

Several years later the Yard was deeply involved in the apprehension and incarceration of the assassins of Abraham Lincoln. John Wilkes Booth had made his escape over the Navy Yard bridge along the Confederate underground route to the south. Instructions went from the Navy Department to imprison the murderer of the President, when apprehended, under a strong guard on a monitor anchored in the middle of the Anacostia. A heavy guard was immediately posted and all was made ready to receive the criminals. During the night the first two accomplices, Mike O'Laughlin and Lewis Paine, were caught and delivered to the Yard. Samuel Arnold was delivered the following morning. The prisoners were placed in irons on board vessels in the stream, and a canvas bag with holes for only nose and mouth was placed over the head of each man "for better security against conversation." These hoods, unusual in the history of public confinement, were designed and made at the Navy Yard. On April 27 David, another conspirator, and the remains of John Wilkes Booth were brought to the Yard and also placed on vessels in the stream. In 1867, two years later, John Surratt was delivered to the Yard after having been captured in Egypt.

Fortunately, most of the Yard's connections with the Nation's history have been more pleasant than that involving Booth.

The waterfront, in particular, has been the scene of many historic arrivals and departures. Typical of this was the arrival on June 11, 1927 of Colonel Charles A. Lindbergh, re-

*Official U. S. Navy Photograph***VULCAN'S WORKSHOP**

Just as Vulcan was the armorer of the gods, so the Naval Gun Factory has designed and built most of the weapons of the U. S. Navy through all its wars. The above picture shows the size of some of the foundry equipment of the Gun Factory.

turning from his history-making first transatlantic solo flight. The hero's arrival touched off a near riot, the likes of which have never before or since been seen in the Navy Yard, but which is not unusual in the American way of greeting its heroes. After Lindbergh disembarked and while the parade which was to take him uptown was forming, some 9,000 people who had formed on the waterfront became hysterical with joy and got completely out of control. The crowd lines were broken, and the guard overrun. The crowd surged over the hero's automobile, the band, and Graham McNamee, the radio announcer, and chaos reigned until some time later when the Yard Police and Marine Guard were able to restore order.

Other historic arrivals at the waterfront piers include the body of the Unknown Soldier, Marshal Joffre and the Allied Commission, Admiral Byrd and his South Pole Expedition, and a part of the "Operation Crossroads" Joint Task Force One, which tested the atomic bomb at Bikini.

Last but far from least in interest in the history of the Navy Yard and Gun Factory are the many odd jobs which have been performed there throughout the years, jobs which have little connection with the Navy but which are, nevertheless, vital to the running of the Nation.

As early as 1802, when the State Department was trying to placate the Emperor of Morocco so he would not interfere with American shipping in the Atlantic, the Yard received a rush order for one hundred specially built, extremely ornate gun carriages to be delivered as a gift to the Emperor to pave the way for smooth negotiations.

During the fall of 1814, when the City of Washington, D. C., was in the doldrums as a result of the ravages of the British, there was a critical shortage of salt. The Navy Yard stepped into the breach and turned over its supplies to the citizens.

In 1922, when the Knickerbocker Theatre collapsed, Yard workmen with blow torches

rushed to the rescue to cut loose survivors trapped in the wreckage.

Giant gears for the Panama Canal locks which could not be manufactured anywhere else were machined at the Gun Factory. The first of a new type frame for artificial hands and moulds for artificial eyes were made in the versatile shops. When the Naval Medical Center at Bethesda needed a special casting of false teeth for research purposes, the Foundry came through. This was the same foundry which had cast the famous bronze Tecumseh, "God of the Pass Mark" of the Naval Academy midshipmen.

For years the Gun Factory has been the home of the Presidential yachts, and the Presidential railway car has been repaired and fitted with special attachments by Gun

Factory technicians and artisans. The famous monorail Senate Subway is kept in running order by Gun Factory personnel.

Since the days of Isaac Hull and *Old Ironsides* the Naval Gun Factory has been a vital cog in the defense of the Nation. It has proven its remarkable ability to change with the times, and there is every reason to believe that this quality of flexibility and adaptability will continue. Weapons may change, but the basic processes for their production will in all probability remain the same except for improvement in method.

Today, when preparedness is more important than ever before, the Gun Factory stands ready to continue to arm the fleet in the air, on the surface, and below the surface with the finest naval weapons in the world.



The preceding article and the ten following pages of pictures give a good pre-view of the new Naval Institute book, *ROUND-SHOT TO ROCKETS*, which is just off the presses and now available to readers of the *U. S. Naval Institute Proceedings*. Prepared under the supervision of the Superintendent of the United States Naval Gun Factory, and written by Gregory Peck, *ROUND-SHOT TO ROCKETS* tells the whole fascinating story of the old Washington Navy Yard and the present Naval Gun Factory. In its more than 350 pages it contains many unique drawings and scores of photographs of the Yard and Gun Factory, past and present, many of them now published for the first time. To the average reader, as well as the reference librarian, the historian, and the student of naval history and armament, this book will be of fascinating interest. The price of the book is \$3.00 postpaid, with a special discount of 40 per cent to all members of the Naval Institute. For your convenience an order blank is printed below.

SPECIAL ORDER BLANK

U. S. Naval Institute
Annapolis, Maryland

Enclosed herewith is check (money order) for \$_____ for which I wish you to send me _____ copies of *ROUND-SHOT TO ROCKETS*.

Name

Address



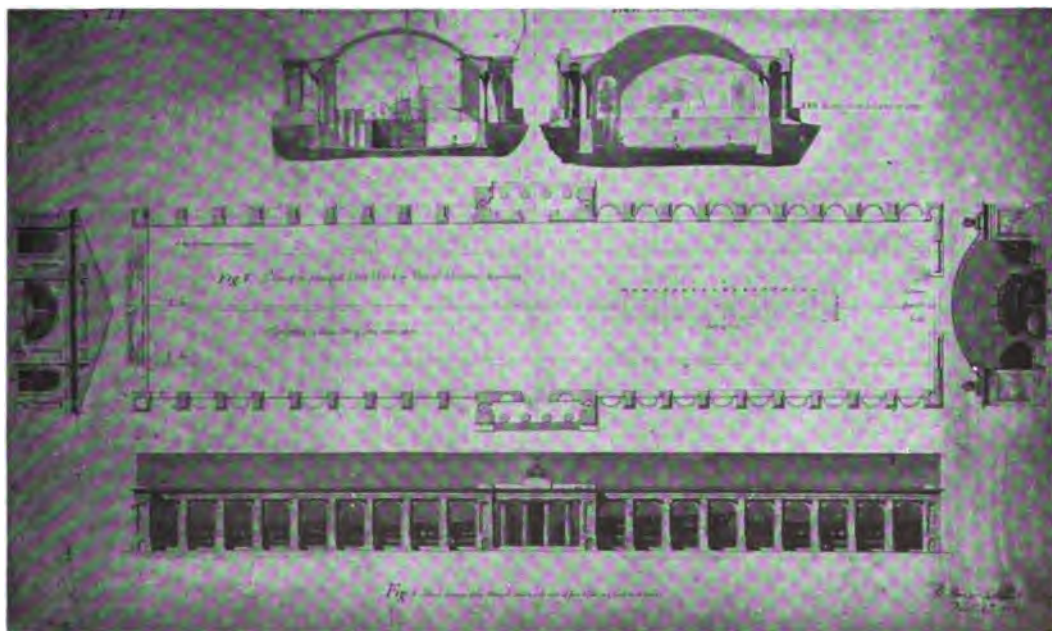
Official U. S. Navy Photograph

The erecting shop at the U. S. Naval Gun Factory where the large guns and mounts are finally assembled and tested. In this picture an 8-inch triple mount of the type used on the *Louisville* class of 10,000-ton heavy cruisers is being assembled.



Official U. S. Navy Photograph

The Washington Navy Yard in 1837. The shiphouse and sawmill were already Washington landmarks. Note the old-style dome on the Capitol in the background.



Official U. S. Navy Photograph

President Jefferson's dry dock. The plan and four elevations show the dry dock which President Jefferson proposed to construct at the Navy Yard. The dry dock would have held the entire U. S. Navy of that time.



Official U. S. Navy Photograph

The experimental ordnance test battery at the Washington Navy Yard in Civil War times. The center gun is a 11-inch Dahlgren similar to the ones on the *Monitor*.



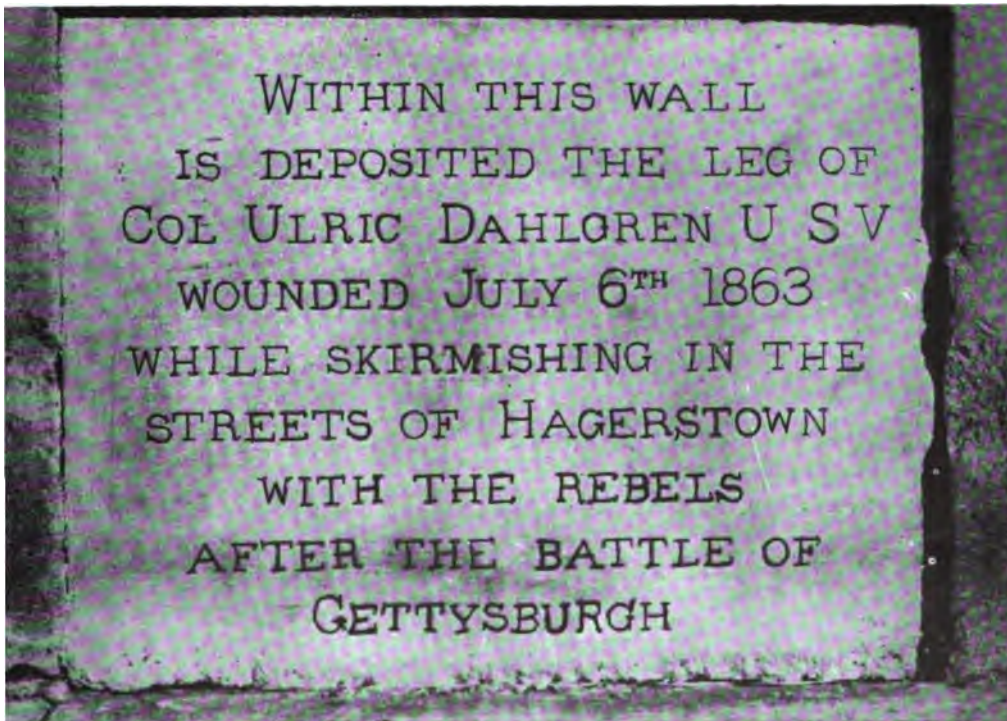
Official U. S. Navy Photograph

The Navy Yard's first contact with the Japanese. The landing of the first Japanese diplomatic mission to the United States at the Navy Yard pier in 1860.



from a Contemporary Magazine

urn of John H. Surratt, one of Booth's accomplices in the assassination of President Lincoln. All of the conspirators for a time were confined in irons on warships at the Navy Yard.



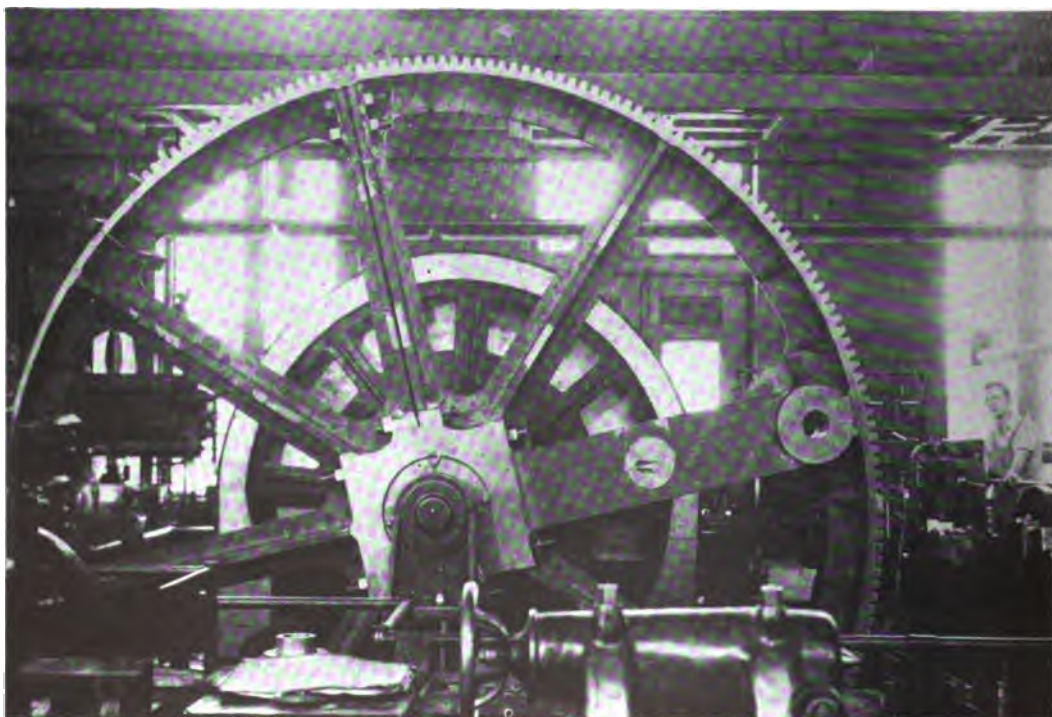
from U. S. Navy Photograph

tablet at the burial place of Col. Ulric Dahlgren's leg at the Navy Yard. Col. Dahlgren, son of the most famous mandant of the Yard, was wounded just after Gettysburg and was later killed in a daring raid on Rich-
1.



Official U. S. Navy Photograph

Built at the Navy Yard in 1898, the David Taylor Ship Model Test Basin was the first scientific apparatus in the United States for measuring water resistance to ship's hulls.



Official U. S. Navy Photograph

One of the giant gears for the Panama Canal locks, designed and built at the Washington Navy Yard.



Official U. S. Navy Photograph

The 14-inch gun of the U. S. Naval Railway Battery blasts the Germans in World War I. These batteries were designed and forged at the Navy Yard.



Official U. S. Navy Photograph

These large early-type aircraft bombs, along with the catapult, were forerunners of the Navy Yard's many contributions to air warfare.



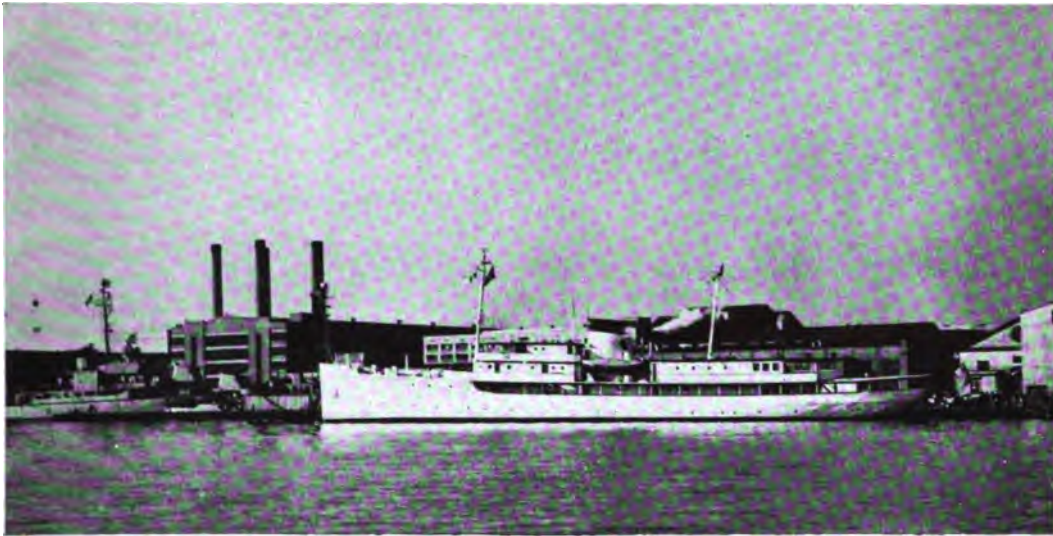
Official U. S. Navy Photograph

King George VI and Queen Elizabeth board the Presidential yacht *Potomac* at the Washington Navy Yard, in 1939, as guests of President and Mrs. Roosevelt.



Official U. S. Navy Photograph

The Yard receives someone greater than the kings of the earth when the body of the Unknown Soldier returns to the land for which he died.



Official U. S. Navy Photograph

For many years the Presidential yachts have been berthed and maintained at the Navy Yard. Shown here is the present Presidential yacht, the U.S.S. *Williamsburg*, at the Yard pier.



Official U. S. Navy Photograph

The President's Railway Car is another familiar charge of the Gun Factory. Special items of equipment as well as routine repairs are made in the Yard.



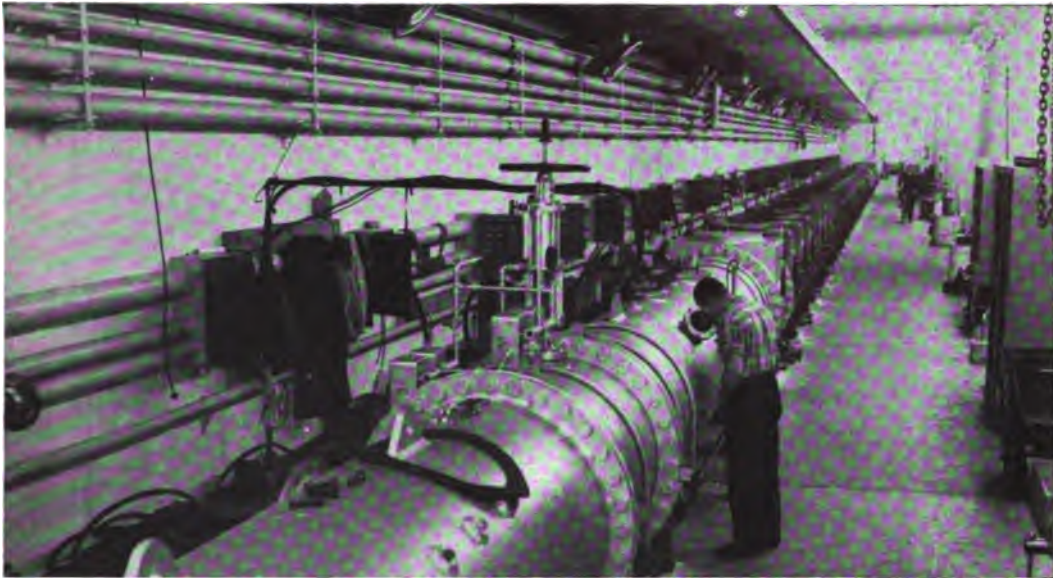
Official U. S. Navy Photograph

Tapping a ladle at the Gun Factory foundry. Fiery cascades fall as the workman opens the tap and the molten metal pours into the mold.



Official U. S. Navy Photograph

Giving equipment the North Pole test. Gun Factory products on ships, planes, and submarines operating in the far north must be immune to sub-zero temperatures.



Official U. S. Navy Photograph

The Naval Gun Factory's new aeroballistics range and supersonic wind tunnel. In this pressurized range for testing missile flight characteristics, the only deviation from an absolutely straight line is that caused by the earth's curvature.



Official U. S. Navy Photograph

A new Martin Mauler carries terrific firepower in her array of bombs, rockets, and machine guns. Components of each of the weapons carried were developed at the Naval Gun Factory.



Official U. S. Navy Photograph

U. S. MARINES IN FRANCE, WORLD WAR I

In earlier days, the British Royal Marines served in land warfare similar to U. S. Marines. Today, except for the Royal Marine Commandos, they serve ashore mainly as a peacetime emergency police force.



DISCUSSIONS COMMENTS NOTES

What Happened to the Royal Marines

(See page 169, February 1949 PROCEEDINGS)

FORMER PETTY OFFICER PHILIP A. C. CHAPLIN, R.N.—I have read with interest the article by Lieutenant Colonel Heinl, U.S.M.C., entitled "*What Happened to the Royal Marines?*" in the February PROCEEDINGS, but I feel that while he has clearly recorded the diverging developments of the Royal Marines and the U. S. Marine Corps during the last fifty years, his article might be supplemented with explanatory and interpretive material. To supply this I have had to consider a much longer period of history.

The important differences between the U. S. Marine Corps and the Royal Marines are as fundamental in their respective nations as the national constitutions. The United States' Constitution is one document, and any action can be referred to court for its constitutionality to be judged. The British constitution on the other hand is a much less tangible and yet more intimate and pervasive force growing out of the customs of the original inhabitants of the island and modified by every subsequent invader, king, dictator, and parliament. Of its two outstanding documents, the Great Charter (1215) and the Bill of Rights (1688), little remains on the statute book, but their tradition of moderate revolutionism lives and has manifested itself in the American Revolution of 1776, the British fleet mutinies of 1812, etc. It is true that in Britain, too, actions can be judged in court in the light of the constitution; but instead of one document, the judges must consider a mass of custom, precedent, and common and statute law, and

then, unless there is some directly applicable provision, the judges' decision will automatically become an *amendment* of the constitution.

If the constitution of the United Kingdom has no concise definition, and that of the Commonwealth is even more vague, can the armed forces of the Crown be more specific? It is not in the tradition of the British to specify. If there are hard and fast definitions, there are also borderline cases, and disputes arise more easily, with two or three services claiming or refusing a given function. With undefined functions and close collaboration between the services, the allotment of a function to one service or another can be worked out without dissension in public.

In the early days of the Royal Marines, naval officers often held Marine commissions and alternated between sea and land service; and later, in the rather fitful first century of the Royals' existence, several army regiments of foot and even of horse served at sea as Marines; the present corps is simply the regiment which has stayed at sea, its men being originally drawn from the Trained Bands of London.

In the late war each of the three services had forces operating in the elements considered the respective preserves of the other two. The Royal Navy had the Royal Marines and the Fleet Air Arm. The Army had the War Department Fleet, the Sea Transport Companies of R.A.S.C., and the spotting squadrons of the Royal Artillery. The Royal Air Force had a few repair ships, a large flotilla of motor craft, and the R.A.F. Regiment for Airfield Defence. The oddest manifestation of this lack of sharp division was the Royal Maritime Regiment of Artillery. After Dunkirk the Royal Artillery had

few field pieces, and at the same time the Royal Navy was short of trained gunnery ratings, so the unemployed gunners were given a short conversion course and spent the rest of the war at sea in merchant ships. They wore a foul anchor on their sleeves as their corps patch.

Lieutenant Colonel Heintz also comments on the Royal Marine Artillery not acting as brigade artillery for the Naval Brigade in 1914. The Blue Marines were first raised in 1805 at Lord Nelson's suggestion because at that time the seamen were the dregs of the population of Britain and were engaged (by all sorts of means) to serve in the Navy. There were no long service men and there was no cadre of gunnery ratings. The R.M.A. was a corps of gunnery instructors until 1859, when seamen on twelve-year engagements replaced them in this function. They were not intended to be field artillery,¹ although it was logical that they might perform field artillery duties when on land service. There was, however, precedent for their not doing so. In the South African war a Naval Brigade, drawn from the companies of some of His Majesty's ships, was landed at Simon's Town. Its first action was at Graspan Kopjes on November 25, 1899, three days after landing. With a company of Yorkshire Light Infantry it led the assault and carried the position. The firing line consisted of 85 Yorkshire Light Infantry² (Y.L.I.), 55 seamen, and 190 Royal Marine Artillery (R.M.A.) and Royal Marine Light Infantry (R.M.L.I.).

The Brigade was led by Captain R. C. Prothero, R.N. Major J. H. Plumbe, R.M.L.I., had the left flank (Y.L.I.), and Commander A. P. Ethelstone, R.N., the right flank (Marines). Captain Prothero was wounded and his two flank commanders were killed. Captain A. E. Marchant, R.M.L.I., assumed command and was confirmed in it and promoted to major the next day. It was the first time in many years that a Royal Marine Officer had been in command of seamen.

¹ In the days when the battleships and cruisers carried field guns, their crews were always seamen.

² Light infantry was a meaningless term by then anyway. All infantry was equipped the same and light infantry regiments could only be distinguished by their foot drill and badges.

The attack was covered by fire from a battery from two naval 4.7-inch guns on field mountings made in the Simon's Bay dockyard and manned by seamen. By March of the following year two more 4.7's had joined the battery, and two of the four were manned by Royal Marine gunners because of casualties and sickness among the seamen. The Marines had been escort to the battery in the meantime.

Lieutenant Colonel Heintz mentions the "budgetary restrictions" of 1923, and, elsewhere, "the frequent amalgamations, inter-service snubs, mergers, budget restrictions and the like." This might give the impression to one who is not familiar with the recent history of Britain that only the Royal Marines suffered from these maladies, especially in 1923. That year was the end of the period when the "Geddes Axe" was swinging. All three services were drastically cut, the Marines with the rest of the Royal Navy, and they to such an extent that the division into artillery and light infantry became a waste of manpower. And here Lieutenant Colonel Heintz is perhaps inaccurate; the reason for the change of name was that the two corps merged, so that all Royal Marines now carry out artillery duties at sea and infantry duties on land service.³

To take Lieutenant Colonel Heintz's summation of the differences between the marine corps of our respective navies, section by section:

(1) *The Undefined Status of the Royal Marines.* The function of none of the British services is clearly defined. The Royal Marines, who pride themselves on being willing to do anything, are the least likely to set the fashion for definitions, which always imply restrictions.

(2) *Lack of a Unique Major Mission for the Corps.* The Royal Marines on shore service are essentially a peacetime emergency force. They have therefore no function to perform away from the fleet in wartime except to bridge the gap between the Royal Navy and the Army, as the Royal Marine Commandos do.

(3) *Lack of Permanent Balanced Tactical*

³ The present Royal Marine uniform symbolizes this dual role. The jacket is of artillery blue, and the trousers are blue with the thin red line of the infantry.

Organization. This is the Army's job; if such a force were required, army troops would be embarked.

(4) *U. S. Strategic Dependence on War-time Bases.* The happy strategic state which Lieutenant Colonel Heintz ascribes to Britain is due to just such acquisitiveness in the past as the United States feels now, but it was less cramped in the eighteenth century by public conscience. For example, Gibraltar was taken in 1704 by landing parties from the fleet, including Royal Marines, to provide a base for operations in the Mediterranean. Perhaps we should say that the Royal Marines have achieved their major mission.

(5) *Differing U. S. and British Concepts of Operations.* I lack the knowledge to comment on this.

(6) *External Strangulation.* As I said above, the Royal Marines' function in war is naval; however, as the Royals have military skill, they are tempted to try to use it when a military occasion presents itself. It is hard for an extraneous body to fit into an organization like the Army's, so the Marines, although they rank as the Nth Regiment of Foot, must be reminded that their war service is at sea, and the best way to keep them at their job is to trim their numbers to fit it.

Regarding the illustrations, I think a better choice could have been made, especially if another picture of the Royals at Antsirane were available. The unshaven, disreputable looking crew in the stern sheets of the boat returning to *Ramillies*, shown on page 174, was landed again an hour later as a *guard of honour*. The substitution of a picture of that guard for the one shown on page 168 would have doubled the effect.

A point to remember in the study of the recent history of the armed forces of the United Kingdom is that the Royal Navy was in favour of the unification of the services, while the Army was not. Lord Fisher considered that the Army should be the Navy's

principal projectile,⁴ and when First Sea Lords think that way, there is not much room left for the development of the Marines beyond the present state of the Royals.

Air Force Navigation, 1948

(See page 429, April 1949 PROCEEDINGS)

FIRST LIEUTENANT DONALD H. SHERR, U.S.A.F.R.—We of the 375th Reconnaissance Squadron feel that Capt. Weems' observations of Ptarmigan flight procedures are both honest and accurate. The article, though short, hits on the most important and significant points of polar navigation as practiced by USAF organizations at the time. In the light of recent innovations, however, his praise of the long hours and hard work put in by the first navigator is a tribute to our diligence rather than our ingenuity. In the past two or three months small improvements have been picked up here and there (usually from men new to the operation) and combined to give this squadron what we feel is the most improved and simple method of polar navigation now in use. We are now taking steps to make these methods known to all military organizations.

The most amazing thing about these little innovations is their obviousness and simplicity. There has been a general opinion long prevalent in this theatre that no further developments in navigational techniques were possible with present equipment. We have been forcibly shaken from this static state of mind and expect many new changes in the months to come.

I would like to underscore Capt. Weems' opinion of the Bendix sextant. It is the only instrument that is really effective in extreme low temperatures. Both the A-10 models and the A-20 are subject to freeze-ups and battery trouble.

⁴ *Memories*, by Admiral of the Fleet Lord Fisher, quoting and endorsing Sir Edward Grey (later Lord Grey of Fallodon). He also wanted to use the Army as a naval reserve.





Official U. S. Navy Photograph

HOW WOULD YOU DECENTRALIZE THIS?

It is estimated that it would cost a billion dollars a year for 10 or 20 years to decentralize our concentrated industries and population centers.



BOOK DEPARTMENT

Both regular and associate members of the Institute may save by ordering books through the Book Department. A discount of 10% is allowed on books of other publishers (except on foreign and government publications, and on books on which publishers do not give a discount). Allow reasonable time for orders to be cleared and books to be delivered directly to you by publishers. Address Secretary-Treasurer, U. S. Naval Institute, Annapolis, Maryland.

MUST WE HIDE? By R. E. Lapp. Addison-Wesley Press, Inc. Cambridge, Mass. 1949. 182 pages+31 illustrations. \$3.00.

REVIEWED BY SENIOR PROFESSOR EARL W. THOMSON, UNITED STATES NAVAL ACADEMY

The present volume is a realistic, middle-of-the-road discussion on the implications of the atomic bomb. As the author states: "When the true facts are widely known we should be able to avoid both the Scylla of fear and the Charybdis of contempt, and to consider radiation as something to be treated with respect, avoided whenever practicable, and accepted when inevitable." The answer to the question in the title is a definite "No!" and further, the conclusion is that our national responsibility as creator and initial user is so great that "*we must not hide.*"

Dr. Lapp has worked with the atomic bomb and nuclear energy since the early days at the University of Chicago. He was co-author of the service text "Radiological Safety for the Armed Forces," and also co-author of the technical book "Nuclear Radiation Physics." The present volume is technically correct, and yet quite readable and thought-provoking. The reader feels the presence of a scientifically accurate background, without being bored by voluminous statistics or difficult formulae.

Dr. Lapp regards the atomic bomb as an

extremely effective weapon, but still not an "absolute" one which would guarantee victory with the first explosion. By the same reasoning the defense against atomic attack would be difficult, but not impossible. An adequate defense will have many divisions: (1) preparation of a strong offense for attack or retaliation, which will include the destruction of the enemy's long-range bombers and bomber bases, (2) dispersal of our centers of population and industry so that attack by atomic bombs becomes economically inefficient, (3) education of the people of the democracy in order to arrive at proper conclusions, and (4) maintenance of our scientific and technological superiority through proper research.

The author argues for a horizontal rather than a vertical expansion in the growth of our cities, and includes several diagrams for possible types of atomic age dispersal-cities. New York and Chicago are cited as the worst possible examples of highly concentrated and industrial cities; Los Angeles and Houston, because of horizontal expansion, are considered as the most desirable cities in which to avoid the A-bomb:

Decentralization is a long-range movement which will not be accomplished or paid for in a few years. If a billion dollars a year were spent for 10 or 20 years, it would go a long way toward catalyzing the spontaneous movement without which decentralization cannot succeed in a democracy.

Numerous phrases in this objective volume are worthy of quotation:

In World War II air power did not live up to the predictions of its potency. . . . Air power had not been decisive, and war could not neglect the land-sea forces of the past.

The Army, Navy, and Air Force must be welded into the same type of land-sea-air efficiency as the Navy illustrated in World War II with its force of submarines, surface and aviation units, and Marines. . . . The problems of atomic warfare present truly challenging problems to military men and they cannot be attacked in either an Army, a Navy, or an Air Force approach; rather they must be approached with the single concept of national security in mind.

The total energy in the San Francisco earthquake has been estimated as 100,000 times that released in the atomic bomb.

According to the exigencies of a wartime operation, the majority of ships (after Bikini-Baker) would have continued in service unless they had been knocked out by the blast.

We can conclude that a properly prepared and alerted country can absorb not a huge but a fair number of A-bombs.

Nuclear propelled aircraft are at least 15 years in the future.

There is no mysterious ray or beam which can be used to prevent an atomic bomb from exploding or to cause it to explode prematurely.

It seems reasonable to assume that other nations will not develop bombs until 1952, and that it will be about 1960 before others can have a sizable supply of A-bombs. . . . It seems from our line of reasoning that a war between two world powers will probably not take place before 1960.

In this age of the atomic bomb the year 1949 seems a good one in which to set up an offensive and defensive plan in preparation for 1960 and beyond.

THE SHIPBUILDING BUSINESS IN THE UNITED STATES OF AMERICA.

Written by a Group of Authorities, and edited by Professor F. G. Fassett, Jr., Carnegie Institute of Washington. New York: The Society of Naval Architects and Marine Engineers. 2 Volumes, 579 pages. \$12.50 a set.

REVIEWED BY CAPTAIN C. S. SEABRING,
U. S. NAVY

In both World Wars American shipbuilders astounded the world and con-

founded our enemies by their gargantuan building programs carried through to almost miraculous completions. Before and after World War I the industry had been in the doldrums, having reached a peak production of 894 ships in 1918, but then having shrunk to a level of precarious survival until the late 1930's. In 1939 but 28 merchant vessels and 27 naval vessels were delivered. Yet four years later, 2,000,000 men and women delivered 20,190 vessels in a single year to meet wartime naval, military, and commercial demands. By then shipbuilding had grown to a thirteen billion dollar a year industry, which completely eclipsed World War I building achievements.

The primary purpose of the publication of *The Shipbuilding Business in the United States of America* was to record and preserve, while the information was still fresh in the minds of the writers, the methods and procedures, and the lessons learned through experience, which made the industrial feats possible. The outstanding attribute of the work is the collection of the considered opinions and conclusions of so many authorities in so many diversified phases of the industry. The work of no fewer than 30 recognized experts, representing both commercial and naval fields, has been skillfully incorporated into a single publication which could well be the model for similar studies of other major industries.

Modern ship design and the mechanics of building operations are adequately discussed in many textbooks, and no coverage of this field is here attempted. The book does, however, treat certain phases formerly untouched in the literature. It includes an analysis of economics and shipbuilding with political considerations which would be of interest to anyone concerned in that field. The history and development of the industry from the colonial era to the present time is very complete; business statistics of shipyards and ship-repair facilities cover the same period. Shipyard layouts and organizations, labor and shipyard wage systems, planning, scheduling, purchasing, material control, production, accounting and other essential operations for orderly, efficient production are all skillfully synthesized by the editor in convenient and practical arrangement.

The book should serve both as a handbook and a classic to those concerned with the shipbuilding industry, and should prove a valuable addition to their professional libraries. Those less technically inclined would find the historical and economic section of the book an interesting reference for those phases of the industry.

THE SEARCH FOR THE NORTH POLE.

By Nellis B. Crouse. New York: Richard R. Smith, 1947. 376 pages. Map in color. \$4.50.

REVIEWED BY ASSISTANT PROFESSOR
W. H. RUSSELL, U. S. NAVAL ACADEMY

This book will interest anyone willing to consider the difficulties of waging war across the top of the world. Through these first-hand accounts of Arctic travel between 1853 and 1909, the reader experiences the problems of mere existence, transportation, and supply north of the 75th parallel. He sees, also, the influence the native population, improved sled-dogs, and steam vessels (as well as other technological and scientific developments) exerted upon the level of human achievement in the area between 1850 and 1910. But in spite of consistent improvement during the last forty years, the book leaves one with the strong impression that temperature, weather, and unpredictable ice formations bar large-scale military bases or rescue-operations north of the 80th parallel in the Canada-Greenland area, or north of the 75th parallel elsewhere in the Arctic.

Without producing new material, Mr. Crouse readably presents the essential stories of European and American Polar expeditions from 1853 to 1909. In addition, he tells of the beginnings of systematic international effort toward scientific study of the European and American Arctic (1875); of the first effort to fly across the Pole (1897); and of Peary's success in cultivating sound relations with Greenland natives, and in living off the country (1886-1902). By reflecting the early interest of the British Navy, U. S. Army and U. S. Navy in Arctic exploration, these accounts furnish background for understanding current military interest in the region.

CAPTAIN DAUNTLESS. The Story of Nicholas Biddle of the Continental Navy. Baton Rouge, La.: Louisiana State University Press, 1949. 317 pages, including bibliography, notes, and index. \$4.50.

REVIEWED BY LIEUTENANT COMMANDER
H. O. WERNER, U. S. NAVAL
RESERVE (INACTIVE)

Despite its melodramatic title of the "sex and sensation school" of historical fiction, *Captain Dauntless* is a first-rate contribution to the literature of American naval history.

William Bell Clark, author of *Lambert Wickes* (1932) and *Gallant John Barry* (1938), is a vice-president of N. W. Ayer and Son advertising agency and has made research on naval history his avocation from the time he was unable to enter the Naval Academy because of defective vision. "The Continental Navy became my field of research" he has written, "first, for my own satisfaction, and then with a desire to impart to those interested a truer picture of the struggle at sea during the War for Independence."

Indeed, Mr. Clark has pursued his studies thoroughly. The short, brilliant career of Nicholas Biddle in full detail and full annotation is for the first time made the subject of a full-length work. No effort has been made to embroider the facts, and none to re-tell the so often told background story. The author mines his own particular vein of the ore.

Nicholas Biddle, fifth ranking officer of the Continental Navy, went to sea at the age of fourteen, was shipwrecked in the West Indies, served as a midshipman in the British Navy, and, while in British service, was a member of the Phipps polar expedition of 1773, as was also Horatio Nelson. It was as skipper of the *Andrew Doria* that Biddle won his fame—fame which brought him command of the *Randolph*, one of the thirteen frigates built for the Continental Navy. And it was on that unlucky frigate he met his death, for he unwittingly engaged the 64-gun *Yarmouth* in a night action in which the *Randolph's* powder magazine exploded, killing all but four of the 305 officers and men aboard.

It is worth noting that the matter-of-fact, detailed work of Mr. Clark succeeds in re-

creating the temper and times of the American Revolution far better than do all except the most praiseworthy of our historical novels.

THE ROYAL AUSTRALIAN NAVY, ITS ORIGIN, DEVELOPMENT AND ORGANIZATION. By Frances Margaret McGuire, Melbourne, Australia: Oxford University Press. 1948. 330 pages plus appendices and index.

REVIEWED BY LIEUTENANT HENRY LUMPKIN,
U. S. NAVAL RESERVE (INACTIVE)

The author of this book has obviously gone to great lengths to procure masses of material pertinent to her subject, or rather subjects. The effort to retain all the necessary data on every possible phase of Australian Maritime History has led to an inclusion of minutiae which add nothing to either the organization or the continuity of the book. For example, four chapters deal briefly with the background of Australian Maritime History, a subject which in itself warrants at least one volume. Five chapters are devoted to the administration of the Navy and the Royal Naval Survey Service. Three more chapters are given to the Port Facilities of Australia, while the remainder of the book is spent discussing "Some Actions and Operations" in the two World Wars. Added to this are life sketches of various naval personalities in Australian history from the eighteenth century down to the present time, and eleven appendices ranging from the "Royal Australian Naval College" to "Amended Rates of Pay, as from July, 1947."

The reader is thus forced to conclude that the author has been somewhat overwhelmed in her desperate attempt to condense all the available material into 330 pages. The facts are there, and she should certainly be commended for a good "try," but I am afraid a definitive history of the Royal Australian Navy still remains to be written.

THE NAVIGATORS' GUIDE TO HYPERBOLIC NAVIGATION. By H. Neville Davies, A.M. Brit. I.R.E., M.I.N. Glasgow, England, Brown, Son & Ferguson, Ltd. 1949. 36 pages. 3 s.—d. net.

REVIEWED BY COMMANDER EDWIN A. BEITO,
UNITED STATES NAVAL RESERVE

In this little book the author gives a brief descriptive account of the basic principles of the various hyperbolic navigational systems. He makes no attempt to explain the technical principles involved, but goes somewhat beyond the simple operational aspects of the various instruments. Included in his discussions are: The Loran, Gee System, Position Plan Indicator, Consol Radio Navigation System, and Decca.

The author emphasizes the fact that hyperbolic systems are not in competition with radar systems but that they are complementary to each other. "A vessel equipped with an efficient radar installation, coupled with a hyperbolic aid, would appear to have all apparatus required for safe and speedy navigation. The former giving the navigator information with regard to obstructions in his path and movements of vessels in his vicinity, the latter fixing his own position accurately and continuously." The navigator is warned that all electronic systems are "aids" to navigation and do not replace established methods.

The book cannot be regarded as a textbook or source book on hyperbolic systems, but is of value to those who are responsible for the actual operation of the necessary instruments.

NEW COMPASS OF THE WORLD, A Symposium on Political Geography. Edited by Hans W. Weigert, Vilhjalmur Stefansson, and Richard Edes Harrison. The Macmillan Company, New York, 1949. 375 pages, including several maps and index. \$5.50.

REVIEWED BY WINSTON B. LEWIS,
ASSISTANT PROFESSOR, UNITED
STATES NAVAL ACADEMY

In 1944 appeared *Compass of the World*, a symposium on political geography edited by Hans Weigert and Vilhjalmur Stefansson, with maps by Richard Harrison. The *New Compass of the World* is of the same character. The editors are the same, and they are still concerned about "the dangerous beginnings of an American geopolitics, with blueprints for American imperialism riding

the waves of the future" and aiming at "a disillusioned balance-of-power solution on the basis of regional groupings, in preparation for what the sponsors of such 'realistic' plans consider inevitable: the Third World War." The *New Compass*, however, is not merely an up-to-date version of the previous work. Most of the contributors are new and, while the reader will find some old themes and old topics recurring, the chapters are new in substance.

The subjects covered range from geography through anthropology and demography, economics, history, and military strategy—all the broad fields in which political geographers attempt to till a strip. The chapters are grouped under five central headings: the Arctic and Antarctic, Russia and the "Heartland," Central Europe, Strategic Areas and Life Lines, and Asia. As might be expected, the contributions are extremely uneven. They range from such suggestive studies as Owen Lattimore's on Inner Asian Frontiers, Strausz-Hupé's able analysis of conditions in India, or Weigert's criticism of Mackinder's heartland theory, to a discussion of Canada's position in the British Commonwealth and in world affairs which is marred by an excessively geographical-geometrical approach.

The determinedly geographic approach is a blemish which recurs in several chapters. Statesmen, military men, and historians have long recognized the importance of geography as a factor in their respective fields. But the editors of the *New Compass* entitle their introduction "History: Geography Set in Motion," and several contributors repeat the phrase. The apposition reflects a confusion between the play and the stage setting. No historian would accept it unless he were thinking of an avalanche. Similarly annoying is the overworking of the adjective "dynamic" by geographers, who, after all, are dealing with one of the most static elements in human affairs. Conversely, some of the most satisfactory contributions are without this geographical prepossession.

In dealing with problems of current

significance it is desirable and yet almost impossible to be completely up-to-date in a published volume. The editors recognize this difficulty, and, while a few of the articles might be modified in the light of recent developments, the volume for the most part consists of background material which will retain its validity.

Perhaps the most impressive part of the book, and one to which the editors devote approximately one-fourth of their space, is that dealing with demographic problems. The chapters on this subject fall primarily in the section devoted to Asia, but they have significance for the rest of the world as well. The responsibilities which the United States has assumed for Japan would make this topic important for us, even if it did not urgently concern one half of mankind and perhaps hold the key to war or peace in the future.

Thumbnail Reviews

The Story of the Ship. By Charles E. Gibson. New York. Henry Schuman. 272 pages. \$4.00.

Because of its clean prose and straightforward style, this popular study of the evolution of the ship, from raft to 80,000-tonner, is a better book than Van Loon's in many respects but not entirely satisfactory. The author, in trying to please every class of reader, will probably satisfy none. The American boy of high school age, for instance, will be annoyed by the British point of view, the neglect of the aircraft carrier, and the skimpy treatment of the submarine. Mr. Gibson knows his subject but cannot be considered successful in his condensation of it.

How To Shoot A Rifle. Published for The National Rifle Association of America by The Infantry Journal Press. Washington, D. C.: 1948. 62 pages. \$1.75.

This practical and attractive pamphlet should arouse interest in, as well as foster the practice of, good marksmanship with the rifle. Excellently illustrated, it condenses in readily understood form the basic principles of rifle shooting. Highly recommended to anyone who may be considering purchase of a target rifle or who wants to improve his marksmanship.





Official U. S. Navy Photograph

TRANSPORTS CROSSING THE ATLANTIC IN WORLD WAR II

The U. S. Army's transport fleet of 320 ocean-going vessels has been transferred to the U. S. Navy, which will operate them in combination with its own transports under the designation of Military Sea Transportation Service.



THROUGH 24 AUGUST 1949

UNITED STATES.....	1188
Navy Takes over Army "Fleet"—Byrd Expedition Cancelled— Germ Warfare—Conolly Advocates Strength—Defense Manage- ment Committee—New Munitions Board Head	
GREAT BRITAIN.....	1191
<i>Amethyst</i> Escapes—Hong Kong Strengthened—Navy May Man Coalships	
USSR.....	1194
Submarines in Arctic	
OTHER COUNTRIES.....	1195
China—India—Scandinavia	
AVIATION.....	1196
B-36 Probe—Tactical Air Force—Jets Refueled in Flight—Comet Tested—Air Operations in Malaya	
MERCHANT MARINE.....	1201
Bids on New Merchant Type—Grain Storage in Ships— <i>Ile de France</i>	
SCIENCE.....	1202
Aeroballistic Range—Rocket Tests at 75 Miles	

UNITED STATES

Navy Takes over Army Fleet

New York *Times*, Aug. 2.—The Army's "fleet," consisting of 320 ocean-going vessels, will be transferred as a unit to the Navy starting in October, under orders issued today by the Secretary of Defense, Louis Johnson.

The transfer was compared in importance as part of the unification program with an earlier order by former Defense Secretary James Forrestal abolishing separate air transportation services and placing them under the Air Force.

The Navy will combine its own and the Army Sea Transport Services under a new military Sea Transportation Service. It will be headed by an admiral, yet to be named, and directed by the Chief of Naval Operations.

The Army's control thereafter will be confined to all joint facilities involved in land transportation, including highway, railway, pipeline and inland waterway facilities, assigned to it by a similar order last March 15.

New York *Herald Tribune*, Aug. 17.—Rear Admiral William M. Callaghan, chief of the recently-established Unified Military Sea Transportation Service, said today that the Navy's pending take-over of all Army ocean transportation would not jeopardize the jobs of nearly 11,000 civilians who are now operating the latter system.

He also gave assurance that the amalgamation will not affect the business of private shipyards engaged in periodic overhaul and repair of the 200-odd vessels to be shifted to Navy management.

"For all practical purposes," Admiral Callaghan said in the first interview he has granted since the consolidation was announced on Aug. 2 by Defense Secretary Louis A. Johnson, "the personnel concerned simply will be shifted from the Army's pay roll to that of the Navy. Most of them have Civil Service status and are licensed in their various seaman's specialties; it is also interesting that, despite having been employed by the Army for years, a great many of them hold commissions in the Navy's inactive reserve."

Admiral Callaghan added that the Navy

would continue to patronize the same shipyards and other facilities employed by the Army for maintenance of its ocean-going craft. This, he said, was "absolutely essential" in order to preserve a civilian nucleus of such organizations which could be expanded rapidly and efficiently in the event of a national emergency.

Consolidation of all ocean-going military transport into a single unit to serve the needs of the Army, Navy and Air Force was directed by Secretary Johnson to be "initiated not later than Oct. 1 and completed as soon thereafter as practicable." Admiral Callaghan's new "fleet," operating under the direction and control of the Chief of Naval Operations, will consist of the old Naval Transport Service augmented by vessels inherited from the Army—a total of more than 300 craft of all types—thereby outnumbering the Navy's total combat strength of 265 vessels.

Antarctic Expedition Cancelled

New York *Herald Tribune*, Aug. 17.—The Navy bowed to budget limitations today and postponed indefinitely Rear Admiral Richard E. Byrd's proposed expedition into the Antarctic.

Admiral Byrd, veteran polar explorer, had been scheduled to lead a task force of eight ships and 3,500 men into the south Polar region this fall to map a large part of the Antarctic continent now being claimed by half a dozen nations.

Under-Secretary of the Navy Dan A. Kimball said the expedition has been cancelled for the time being because of "compelling reasons of economy."

Mr. Kimball said he acted on his own initiative after Secretary of Defense Louis Johnson ordered the Navy to cut down on all spending wherever possible.

"Secretary Johnson didn't ask me to do it or not to do it," he said. "I told him this morning that I was going to do it."

Germ Warfare Defense

Chicago *Tribune*, Aug. 21.—Frederick, Md.—If biological warfare comes to the United States, the civilian population will be defended by germ fighters dressed in uniforms such as a man from Mars might wear.

Army scientists described the weird garb which has been perfected at Camp Detrick, the government's super-secret germ warfare defense plant near here.

The uniforms will be worn by members of decontamination squads. They form a head to foot, hermetically sealed covering.

SPRAY POISON AREAS

Air will be pumped into the suits through hoses leading to mobile compressor units. One compressor, gas engine operated, will be able to supply air to several germ fighters, who will spray disinfectants over contaminated areas, the scientists disclosed.

In addition to these precautions, the scientists also disclosed they have designed a 100 per cent foolproof filter, which can be installed in the air lines leading to insulated suits.

What substances the filters contain to make the scientists so sure that no death dealing organisms can pass beyond the germicidal barriers, was not disclosed.

URGE MORE STUDY

The scientists, under the direction of Dr. Oram C. Woolpert, Camp Detrick's director, told *The Tribune* that the filters for the special uniforms cannot be used to screen out infectious agents that might be liberated into the ventilating systems of large enclosures.

They recommended, however, that more study be devoted to perfecting similar devices capable of handling bigger air volumes.

One gets the impression in talking with the scientists that there are many unknown and variable factors involved in germ warfare and its defense.

Dr. Woolpert pointed out that germ warfare, potentially, is a highly selective weapon. It might be used against plants, animals or men as the attacker wishes, he explained.

However, Dr. Woolpert added, there are many "offsetting factors that would tend to break the chain" in effective use of biological substances as new weapons of attack.

DEFENSES OF NATURE

"Natural defenses would operate to large extent," Dr. Woolpert explained. "There are

the mechanisms of natural immunity, sunlight, settling out and drying that would come to the defense of the civilian population in addition to any artificial protection that could be employed," he said.

"Life would be intolerable if bacteria and other pathogens did not thin out from natural causes," he added. "However, we must take into account that an enemy would be just as smart as we are."

"B. W. should not be regarded as an all or none weapon," Dr. Woolpert emphasized. "If it should be employed against us, it is likely to be used to complement and supplement other forms of attack."

Admiral Conolly Advocates Strength

London *Times*, July 13.—The unbalance of power in certain localities constitutes one of the great dangers of the present world situation, declared Admiral Richard L. Conolly, Commander-in-Chief of the United States Naval Forces in the Eastern Atlantic and Mediterranean, when he was the guest of The Pilgrims at a luncheon at the Savoy Hotel yesterday.

From the first world war, he said, Americans returned disillusioned, frustrated, and convinced that their former policy of isolationism was right. In the last war their heritage as a spectator nation was left behind for ever, and in the crucible of war a new destiny was wrought for America.

At present the Western Hemisphere Defence Pact, Western Union and the Atlantic Pact all attested the unity of good intentions of critically important groups of nations. For any of those pacts to be effective as a shield against aggression they must be supplemented and girded by adequate military defence. As the world was constituted to-day and for the foreseeable future this conclusion was inescapable. And the elements of military strength surely included the morale of the populace and its moral fibre, the intelligence and technical skill of its people, their industry and energy.

But to preserve their self-respect they must have the resources, the equipment, the training, and the organized military forces capable of contributing effectively to the protection of their own liberties and the preservation of their independent national

existence. They should permit no merchant of propaganda to distort this or misrepresent it as an armaments race. It was prudent preparedness to defend liberty which, like a man's sacred honour, could never be entirely entrusted to others. Let us not be ashamed to be strong and let us not apologize for building and maintaining our military defences.

No single nation would ever again be strong enough to face combinations of potential aggressors without strong allies. Collective security was in reach if we did not falter.

Business Efficiency in Defense Department

Army-Navy Register, Aug. 13.—Instituting a continuing program for maximum reduction of Department of Defense expenditures, consistent with maintaining military effectiveness and existing statutory authority, Secretary of Defense Johnson on August 10 appointed a National Defense Management Committee and a Management Advisory Group.

The Committee is headed by Gen. Joseph T. McNarney, present Chief of the Air Force Materiel Command and a member of the Research and Development Board, who has been on temporary duty as adviser to Secretary Johnson on organization and administrative matters since Mr. Johnson took office on March 28. Gen. McNarney also has headed a staff group in the Office of the Secretary of Defense which has been eliminating unnecessary groups. To date, 134 committees and boards have been abolished.

Gen. McNarney has been relieved from duty with the Air Force and assigned to the Department of Defense.

The members of the Committee are Secretary of the Army Gordon Gray, Under-Secretary of the Navy Dan A. Kimball, and Assistant Secretary of the Air Force Eugene M. Zuckert.

Robert Heller and Associates of Cleveland, Ohio, who have an international reputation for accomplishment in the business management field, will provide the personnel for the Management Advisory Group. This group will work under the leadership of Robert Heller, head of the firm, and under the

active direction of Frank L. Elmendorf, the vice-president. It will include also two other members of the firm, Fred E. Raach, a specialist on cost accounting, and Frederick O. Robbins, a specialist on organization.

Secretary Johnson, in a memorandum to all Defense Department Components, emphasized that the work on the program, which will be started on August 15, 1949, is a joint undertaking.

"It involves," Secretary Johnson said, "both a long term program and the immediate institution of measures to effect very substantial economies and increased efficiency of operations. Every advantage will be taken of past studies, surveys and reports, and of economy measures already instituted by executive action within the three Services. I wish to emphasize that this must be a fast moving operation and that it cannot be accomplished without the facilities and cooperation of the Services."

Secretary Johnson's instructions to the Management Advisory Group are that it will:

- (a) "Examine current and prospective programs of the Department of Defense designed to reduce expenditures through reorganization, management control and increased efficiency of operations.
- (b) "Recommend to the Management Committee policies, plans and procedures required to establish co-ordinated continuing programs to achieve the maximum reduction in expenditures consistent with maintaining military efficiency.
- (c) "Recommend to the Management Committee and the Secretaries of the Army, Navy and Air Force such reorganization, changes in procedure, elimination, reduction or consolidation of functions, facilities or personnel, and/or additional surveys, reports or investigations as may be indicated.
- (d) "Assist in establishing such programs, policies, plans and procedures as may be agreed to or directed by appropriate authority."

Robert Heller and Associates, retained by the Department of Defense to provide the Management Advisory Group, has a broad experience in Federal Government, both in Congress and in the Executive Branch, and in industry. This firm recently completed a study of the Post Office Department.

Mr. Ilgenfritz to Head Munitions Board

New York *Herald Tribune*, Aug. 13.—President Truman today nominated Carl A. Ilgenfritz, vice-president of the United States Steel Corporation, to be chairman of the Munitions Board, which has responsibility for military buying programs.

The second business man to head the Munitions Board, Mr. Ilgenfritz has been vice-president of United States Steel since December, 1946. Before that he was an executive of the Carnegie-Illinois Steel Corporation and the Republic Steel Corporation.

He is already a member of Munitions Board committees on nonferrous metals and iron and steel, and also has been acting as an adviser to the Federal Bureau of Supply. He was a member of the Hoover Commission on Government Reorganization, and served as an adviser to the State Department on the question of international tin supplies.

A native of Youngstown, Ohio, Mr. Ilgenfritz would take charge of the military agency that has the chief job of planning the military side of mobilization in event of another war. The board, which was renamed the Munitions Board under the unification act of 1947, prepares estimates of potential production, procurement and personnel for use in figuring strategic war plans. It also recommends assignment of buying responsibility among the various services, and has a big job in cutting military costs by trying to standardize the purchases of the services wherever possible.

The board also has charge of the nation's huge program of storing scarce materials for use in an emergency.

GREAT BRITAIN

Amethyst Escapes

London *Times*, Aug. 1.—Hongkong.—H.M.S. *Amethyst* slipped her moorings last night and, successfully overcoming more than 140 miles of navigational hazards on a pitch-dark night, safely gained the open sea. She is at present with the destroyer H.M.S. *Concord* off the mouth of the Yangtze, and is expected to head south for Hongkong under her own steam to-morrow. Vice-

Admiral A. C. G. Madden, Flag Officer and Second-in-Command, Far East Station, left Hongkong to-day in the cruiser *Jamaica* to meet her.

The first announcement of her escape was contained in a statement issued by the naval authorities this morning. "H.M.S. *Amethyst*" it said, "has been held hostage on the Yangtze since April 20, and has been on half rations since the beginning of July. At about 10 o'clock last night she slipped her cable in defiance of her gaolers to escape down the river. She immediately came under heavy fire from shore batteries that had been watching her for months and had frequently threatened her destruction. She managed to get past this initial opposition, and at 1 A.M. to-day, by skillful navigation without the help of a pilot, she reached the Kiangyin forts. Once again she came under heavy fire, but succeeded in negotiating a boom and an extremely difficult part of the river without serious damage or casualties. At 2:30 A.M. she was still on her way down river. Although our hopes are high, and we are all indeed proud of her feat, she still has dangers to negotiate."

This was followed shortly afterwards by a second statement:—

"At 5:30 A.M. to-day H.M.S. *Amethyst* passed the Woosung forts and met H.M.S. *Concord*. Apart from the opposition of the forts and batteries, the *Amethyst's* passage was a superb feat of pilotage carried out at full speed on a pitch-dark night. A strong current and a flooded river accentuated the all-round difficulties of the Yangtze. She sustained no casualties.

NAVIGATIONAL HAZARDS

Naval officers here, especially those who know the Yangtze, are unanimous in their praise for the skill with which the navigational difficulties were overcome. The Yangtze is one of the trickiest rivers in the world, and in the past even naval vessels always took on special pilots. Especially below Kiangyin the river debouches into an expanse of dangerous—and constantly shifting—sandbanks. One officer who knows the river well says that he put the navigational dangers as three times more formidable than the opposition to be expected from the

Communist shore-based batteries. The *Amethyst* was under the command of Lieutenant-Commander J. S. Kerans, assistant naval attaché in Nanking, who worked his way down to her and took over command after the original encounters in which Commander Skinner was killed.

CAPTAIN'S STORY

London *Times*, Aug. 4.—Lieutenant-Commander Kerans told your Correspondent that two things made him decide to try to make the dash for the open sea. The first was the Communist refusal to let him have any fuel and his growing conviction that they did not intend to let the *Amethyst* go anyway. The second was the steady worsening of the physical condition of the crew. The date and timing of the escape depended partly on the moon and partly on the estimated steaming time to the open sea. Except for one other officer who was in the secret, the ship's company were informed only on the day of the projected escape, Lieutenant-Commander Kerans having concluded that the less time they had to mull over this hazardous venture the better for their morale. He himself put the chances at fifty-fifty.

He said that the trickiest part of the whole operation was the initial getaway. The *Amethyst* was pointing upstream and had to make a 180 deg. turn, and it was known that there were Communist batteries trained on her. He had packed the cable with sacking to reduce noise when it was slipped and had spread dark canvas along parts of the superstructure to try to alter the silhouette. It was several minutes before the Communist gunners realized what was happening, but then fire was intense and the machine-gun fire was withering. The *Amethyst* was hit on the starboard bow by a shell estimated to be a 75 mm. He had previously decided that if anything went wrong he would beach the ship and blow her up. For a few minutes he thought this might be necessary. Not only was the fire intense, but he was having difficulty in getting under way. "They were anxious minutes," he said.

Fortunately the Communist gunners registered no further hits, and he had now fallen in behind a river steamer. The Communist charge, made yesterday over Peking radio,

that the *Amethyst* sank this steamer Lieutenant-Commander Kerans dismissed as an absolute lie. The *Amethyst* fired only one round with her large gun, although plenty with Brens and Oerlikons, but the fire was directed exclusively at the shore batteries to try to keep them quiet.

Just round the bend in the river there was the mix-up with a Communist gunboat or light naval vessel which later appeared to have been hit by the Communist guns. Men in the *Amethyst* could see the gunboat's crew jumping into the water. Trouble was expected at Rose Island, where the original engagement took place; nothing happened there, but they were fired at for a quarter of an hour going past the Kiangyin forts. The boom they had to get through consisted of a row of sunken ships originally laid by the Chinese at the beginning of the Sino-Japanese war, with a narrow channel marked by white buoys.

Lieutenant-Commander Kerans said that the echo-sounding apparatus helped them in their navigation. The fact that the river was in flood helped them in one way, but was a disadvantage in that it concealed certain well known sandbanks and other landmarks. They drove the ship's engines for all they were worth. The heat in the engine-room rose to 150 deg. and was so stifling that two men fainted.

Asked about his negotiations with the Communists and the way in which the latter treated him, Lieutenant-Commander Kerans said: "I was treated with the utmost discourtesy. Everything was thrown at me. I was subjected to personal vilification for weeks on end. They even threatened me with the destruction of my ship." He said that what the Communists really seemed to be after was an admission by the British that they had "wrongfully and criminally invaded Chinese national waters." They made the granting of a safe-conduct conditional upon a number of completely false admissions by the British Government which the latter were not prepared to make. The Communists throughout insisted upon the matter being negotiated and settled locally instead of letting it be dealt with at a higher level and through diplomatic channels. "I used to feel that I was up against a stone



Official U. S. Navy Photograph

HONG KONG, STRATEGIC BRITISH OUTPOST IN CHINA

Seen across the flight deck of a U. S. carrier is the city and harbor of Hong Kong. Great Britain is steadily strengthening her garrison here.

wall of indifference. We once argued for three hours about one sentence," he said.

PERIOD OF UNCERTAINTY

Colonel Kang Mao-chao, the chief Communist negotiator, who also commanded the 3rd Artillery Regiment on the Chinkiang front, concealed the fact that he spoke English and insisted that all the negotiations be conducted through his own interpreters. Only a few days before the escape Lieutenant-Commander Kerans discovered that Colonel Kang spoke quite tolerable English.

Members of the crew told your Correspondent that worse than any of the physical discomforts—the heat, mosquitoes, and short rations—was the long period of uncertainty of what lay ahead for them. The mornings would be spent in keeping the ship

clean and serviceable, but they had little to do for the rest of the day and could not go ashore. For several weeks they had been on half rations, and had had bread only twice a week. All spoke highly of the eight Chinese mess-boys, who remained with the ship all through and displayed never-failing cheerfulness.

The Peking wireless version of the incident [reported in *The Times* yesterday] is the version that is being disseminated throughout Communist China. There is no means of correcting it. Whether the Communists will take any retaliatory action against British interests remains to be seen.

The Defence of Hong-Kong

Manchester Guardian, July 23.—Hong-Kong.—Recent announcements that the

1st Battalion King's Own Scottish Borderers, is being posted to Hong-Kong, and that the *Georgic* has left Malta with the main body and equipment of the Third Royal Marine Commando Brigade draw attention to the steady progress which is being made in building up the garrison of the colony.

It is understood that when current troop movements are completed the total strength of the garrison will be approximately twenty-five thousand men. This is more than twice the figure of 12,000 which has appeared several times recently in unofficial statements and it illustrates the extreme importance which the British Government attaches to the maintenance of Hong-Kong's present status.

Indeed, it is probable that there are already more than 12,000 troops in the colony. They are now in the process of being formed into the Fortieth Division under the command of Major General G. C. Evans, who arrived recently. It was also learned to-day that Brigadier M. S. K. Maunsell, whose last appointment was Second-in-Command at Sandhurst, will be arriving shortly to become Chief of Staff to Lieutenant General Festing.

MORALE STRENGTHENED

There is no doubt that these vigorous measures taken by the British Government, which are on a far greater scale than even the most sanguine of local residents hoped for or expected, have had a steadying effect on local morale, which was rather shaky three or even two months ago. Whatever attitude or tactics the Communists decide to adopt towards Hong-Kong—and there is still no indication from their side of what these will be—it is obvious that during the coming months Hong-Kong will experience difficult and testing times. It looks fairly certain that Hong-Kong is destined to play a vital part in the cold war in Asia, similar to that which Berlin and Trieste have played in Europe.

Fortunately the recent behaviour of the Communists towards foreign interests in Tientsin and Shanghai has made people here take a far more realistic attitude towards the Chinese Communists and there is far less wishful thinking than there was a few weeks ago.

CROWDED COLONY

The administrative problems arising out of the arrival of so many troops in a small colony which already contains three times the civilian population it can comfortably accommodate can readily be conceived. Under the circumstances, it has been unavoidable that the necessary requisitioning which is carried out by the civil Government, at the request of the military authorities, should have caused some distress and have given rise to considerable criticism in the local press.

It has been difficult for the inhabitants to appreciate the scale of the installations needed by a large modern military force, with all its ancillary units and elaborate technical requirements.

(EDITOR'S NOTE: See August PROCEEDINGS, Professional Notes.)

Australian Navy May Man Coalships

New York *Times*, Aug. 8.—Sydney.—The Australian Government, already using troops in strike-bound coal mines, plans to use naval personnel to man coal ships, on which the Seamen's Union last month imposed a "sympathetic blockade," usually reliable sources said here today.

These sources said the Federal Government also would use naval personnel on the docks if workers refuse to handle troop-mined coal.

Troops called in to work the strip mines of New South Wales—strike-bound for seven weeks—are working all day today to raise their first week's production figures.

U.S.S.R.

Submarines Operating in Arctic

New York *Times*, July 23.—Hammerfest, Norway.—Reports of fishermen operating from this and other ports on the "roof" of the Scandinavian peninsula appear to indicate that the Soviet Union's naval base at Murmansk, 265 air miles to the southeast is far from being dormant.

Several fishing smack crewmen with whom the writer has talked say they have occasionally observed submarines sometimes in flotilla formation, their silhouettes suggesting that they are Russian. Submarines have

been spotted in various areas, always well outside Norwegian territorial waters. Some fishermen go as far afield as the edge of the Polar ice pack around lat. 80 degrees N. and while these informants had seen no submarines in the general vicinity of Spitsbergen they asserted that comrades had.

Reports on these craft concur on size and speed. The average estimate is that they are 250 feet long. Estimates of speed vary from fifteen to twenty knots. Whether these are post-war units, transferred from the Arctic, through the Lake Onega canal, it is impossible to establish from these rather vague accounts.

MANEUVERS HELD NORMAL

The Soviet fleet has always stationed a number of submarines at Murmansk and Archangelsk and may have some in Petsamo, annexed from the Finns in the 1946 peace treaty. It is perfectly normal that they should maneuver in waters so close to their home bases, but local inhabitants, who have been made fairly sensitive by the Soviet Union's two Atlantic Pact notes to Norway, no less than by the move in 1947 to revise the Spitsbergen Treaty, read more significance into the submarine reports than the situation may warrant. Keeping the sea communications open is vital to the defense of this exposed area and repeated warnings by the new Commander-in-Chief, Admiral T. Horve, that Norway must improve her defense against high-speed submarines, have been taken here as applying to North Norway in particular.

OTHER COUNTRIES

China

Blockade Enforced

New York *Herald Tribune*, Aug. 12.—Hong Kong.—The Chinese Nationalist navy sank one Communist ship and ordered four foreign vessels, including the United States Lines' *Iran Victory*, out of Taku Bay Tuesday in an effort to enforce its blockade of the North China coast.

The Nationalist Central News Agency, which reported the navy's action, said twelve Chinese steamers were detained. The ships were all off Taku, port for Communist-held Tientsin.

The other three foreign ships were Panamanian, including the *Atlantic Trader*. Central News said Nationalist gunboats escorted them from the port and warned them not to return. The agency declared the ships were all blockade-runners, flouting Nationalist "closure" of Tientsin and Taku.

Two of the Chinese ships which ignored the Nationalist warning to halt when they tried to enter the bay were fired on and one 1,000-ton vessel was sunk, according to the report. The gunboats also destroyed four barges and three small Communist boats.

MESSAGE TO LONDON

[In London, S. Livanos and Company, agents for the Atlantic Maritime Company's 7,000-ton cargo ship *Atlantic Trader*, said they had received a telegram from the master of the vessel off Tientsin on Tuesday which said: "To-day, at 11:30 A.M., an officer with twelve armed men from Nationalist warships boarded my ship. They asked for some information and ordered me to abandon immediately the port and the North China coast. Between 3:30 P.M. and 4 P.M. one of the ships was fired on and sunk by the warship."

[S. Livanos and company said the *Atlantic Trader* is an American-built Liberty ship, flying the Panamanian flag, with a Greek master and crew members of different nationalities. They said it was waiting to take on a cargo of salt consigned to Japan at Taku when boarded by the Nationalists. It now is proceeding to Japan, the agents said.]

The United States Lines confirmed that the *Iran Victory* had been at Tientsin, but said it had had no direct word from the ship, which left Hong Kong Aug. 6 en route to San Francisco and Los Angeles.

India

London *Times*, July 29.—At Portsmouth to-day the destroyer *Rotherham*, 1,750 tons, was transferred by the Royal Navy to the Royal Indian Navy and renamed H.M.I.S. *Rajput* by Lady Willis. Admiral of the Fleet Sir Algernon Willis, Commander-in-Chief, Portsmouth, formally handed over the ship. The High Commissioner for India, on behalf of his Government, expressed appreciation

of the cooperation and good spirit shown by the Admiralty and the Royal Navy in helping to build up the Royal Indian Navy.

The *Rajput* is to be the leader of the first R.I.N. destroyer flotilla. On leaving England she will be accompanied by two other destroyers, the *Ranjit* and the *Rana*, which have been transferred to the R.I.N.

Scandinavia

London *Times*, July 14.—The Norwegian submarines *Ulsira* and *Ulvær*, and the escort vessel *Sarpen* will arrive at Portland on Saturday for a six-day courtesy visit. Commander S. Valvatne, head of the Norwegian submarine division, will be the senior officer of the group. A squadron of Swedish warships comprising the cruiser *Kronorad* and the destroyers *Uppland*, *Oland*, and *Visby* will be in south Dorset waters from July 20 to July 22.

AVIATION

B-36 Probe

Aviation Week, Aug. 22.—Sensational new performance figures for the Convair B-36 intercontinental bomber were revealed to the House Armed Services Committee during its investigation of U. S. Air Force strategy and procurement.

New B-36 data included:

Top speed of more than 435 mph. and altitude of more than 50,000 ft. have been attained by the B-36D prototype equipped with two pod nacelles housing four General Electric J-47 (5,200 lb. thrust) turbojets.

Simulated combat mission of well over 10,000 miles has been flown non-stop without aerial refueling by a B-36D of the Strategic Air Command. Bomb load of 10,000 lb. was dropped well beyond the 5,000 mile mark.

B-36B has flown 6,000 miles above 40,000 ft. averaging 300 mph. This mission covered considerably more mileage above 40,000 ft. than would be required for maximum penetration to Russian targets.

USAF plans to purchase an additional 79 B-36Ds during fiscal 1950-51 to bring total B-36 strength to 249 planes, deployed in four bomb groups and two strategic reconnaissance groups. Total of 28 are scheduled for purchase in fiscal 1950 with 51 earmarked for the fiscal 1951 budget.

Cruise control techniques developed by Strategic Air Command make a range of 12,000 miles for the B-36 "well within reason."

B-36 bombers of the Eighth Air Force have already flown simulated missions against points duplicating all possible top priority targets in the Eurasian land mass. Results of these missions have convinced Lieut. Gen. Curtis LeMay, SAC commander that the B-36 would be effective against these targets in wartime.

These data were presented during five days of hearings on Capitol Hill climaxed by two sharp clashes—one between Air Secretary W. Stuart Symington and Rep. James Van Zandt (R., Pa.) and the other between Gen. George Churchill Kenney, commander of the Air University, and Lieut. Gen. Curtis Emerson LeMay, who succeeded Kenney as commander of the Strategic Air Command.

Symington Angry.—Symington took the offensive against Van Zandt on the final day of the Washington hearings before packed press tables and gallery. Obviously angry to the core, Symington demanded that the Pennsylvania congressman and Naval Reserve captain who instigated the B-36 investigation produce proof of his charges against Symington, the Air Force high command and Defense Secretary Louis Johnson.

Symington Challenge.—Symington also challenged the anonymous authors to "stand up and be counted, produce their documents and their witnesses, throw open their files to you (the committee counsel) and establish the good faith and accuracy of their charges." Symington denied in detail all of the charges contained in Van Zandt's speech adding considerably to his earlier rebuttal of these allegations.

Highlights of his rebuttal included:

The B-36 is a true intercontinental bomber.

There has been no consideration other than national security influencing the purchase of B-36 bombers and cancellation of contracts for other kinds of aircraft.

Kenney vs. LeMay.—The other clash, between Kenney and LeMay, occurred over tactics to be used in intercontinental bombing with the B-36. These two outspoken generals have long disagreed over strategic bombing tactics. Top level USAF endorse-

ment of the LeMay views, is generally credited with having caused Kenney's replacement by LeMay as SAC commander. Kenney testified that he did not credit his early opposition to the B-36 with causing his transfer from SAC.

Kenney asserted he would use the B-36 solely at night because accuracy now obtainable with radar bombing made it foolish to abandon the defensive cover of darkness for daylight attacks.

Expect 100 Back.—"If I sent 100 B-36's on a long range bombing mission, I would expect to get 100 back, barring mechanical troubles," Kenney told the committee.

In response to questioning, Kenney repeated:

"The B-36 is a night bomber. I would not use it in the daytime."

LeMay View.—LeMay took the responsibility of being the chief USAF advocate of the B-36 and told the committee the B-36 was a round-the-clock bomber capable of attacking in daylight or in darkness.

"I believe we can get the B-36 over a target and not have the enemy know it is there until the bombs hit," LeMay testified.

No Interceptors.—Kenney and LeMay agreed that neither the United States nor any other nation, to their knowledge, had a night fighter capable of making interceptions and successful attacks in darkness or bad weather above 40,000 ft. Kenney estimated it would take five years for an efficient high altitude night fighter to be developed.

They disagreed on the effectiveness of current day fighters against the B-36. LeMay pointed out that it was ridiculous to suppose that the B-36 could not be intercepted and shot down by a fighter under certain conditions but that it was extremely difficult to do so under combat conditions if the B-36 was above 40,000 ft.

Banshee's Chances.—Kenney said he thought the fighters would be very successful in a blue sky when the vapor contrails of the B-36 would be visible 100 mi. away.

He said he thought that both the Navy's McDonnell Banshee (F2H-2) and the British Vampire jet fighters could probably intercept and attack the B-36 successfully in daylight.

Carrier Cancellation.—Both Kenney and LeMay indicated they concurred with the

Secretary of Defense's decision to cancel the super-carrier.

"It was a wise decision," Kenney said.

"There is now no Navy plane that can take-off from a carrier deck, deliver an atom bomb to a target, and land again on the carrier," LeMay told the committee. "They have no plane that can go 10,000 miles, carry 10,000 lb. of bombs and fly above 40,000 ft."

Engine Trouble.—Kenney testified that his early sad experiences with the B-36 during its initial test period were caused principally by early models of Pratt & Whitney Wasp Major engines.

"The early engines overheated so badly the XB-36 was lucky to get to 30,000 ft. and stay there," Kenney testified. "It was impossible to tell how high the airplane would really go. When the engine problems were licked and the B-36 hit 40,000 ft., it became a completely different picture."

Aerial Tankers.—He admitted that at one stage the B-36 picture looked so glum that he recommended using the planes already built as aerial tankers to refuel B-50 and B-54 bombers. Kenney said he was not satisfied with Air Materiel Command's assurances that the B-36 troubles could be cured and he did not share their optimism over the promise of the Pratt & Whitney VDT engine in its proposed application to the B-36. USAF later admitted this program was a "complete failure."

Kenney said the performance of the B-36 during early 1948 surprised him, Convair engineers and the rest of the Air Force.

Higher and Faster.—"The B-36 went higher, faster and farther than anybody thought it would, and the pilots liked it," Kenney said. "It was a lucky freak."

LeMay testified that he encountered considerable opposition to his early arguments before the Senior Officers Board for more B-36's and he thought his chances of getting them were slim. By early 1949 he thought the B-36 was better than the B-54 would be and that the Boeing B-47 would be considerably better than the B-54 ever could be. He picked the B-47 as his alternate bomber choice if the Board turned him down on more B-36's.

No Other Plane.—Gen. Hoyt Vandenberg, USAF Chief of Staff, supported LeMay's

views on strategic bombing stating that LeMay had had more experience participating in and planning for strategic bombing than any man in the world. Vandenberg said the USAF was faced with the alternative of buying more B-36's to carry out its assigned primary mission of strategic bombing or not buying any bombers at all since no other plane would do the job.

To Reconvene.—The committee is scheduled to convene again in Washington on Aug. 22 after a subcommittee flies to the Pacific Coast to take testimony from Gen. H. H. Arnold, retired USAF commander; Donald Douglas of Douglas Aircraft Co.; J. H. Kindelberger and J. L. Atwood, of North American Aviation Inc.; John Northrop and Gen. Echols, of Northrop Aircraft, Inc.; Robert Gross of Lockheed Aircraft Corp.; and William Allen of Boeing Airplane Co.

Committee's Washington hearings were concerned only with the first two items on its seven point agenda:

1. The truth or falsity of all charges reported by Van Zandt.

2. Examination of performance characteristics of B-36 bomber to determine whether it is a satisfactory weapon.

Other points are:

3. Locate and identify the sources from which the charges, rumors and innuendoes reported by Van Zandt have come.

4. Examine whether the USAF is putting too much emphasis on strategic bombing at the expense of air support of ground forces.

5. Examine the decision to cancel the \$189,000,000 super-carrier planned by the Navy.

6. Examine the roles and missions of the USAF, Navy, and Marine Corps.

7. Examine whether it is wise for two of the armed services to pass on the weapons to be used by a third. This will go into the procedures used in Joint Chiefs of Staff meetings where a 2 to 1 vote is now final.

(EDITOR'S NOTE: To be continued.)

Tactical Air Force

Aviation Week, July 25.—U. S. Air Force moved this month to ease its strained relations with the Army over tactical air support of ground forces.

USAF action included:

Assignment of an improved version of the Republic Thunderjet (F-84D and E) as a tactical air support plane.

Creation of a new Tactical Air Force with headquarters at Pope Field, Ft. Bragg, N. C., for close co-operation with the Army in joint air-ground training maneuvers.

Lack of adequate air support planes and joint training facilities have been the two major points at issue between USAF and the Army. The controversy was also politically important since USAF has been winning major decisions over the Navy by a 2 to 1 vote of the JCS which saw USAF and Army chiefs of staff vote together against the Navy.

Army Unhappy.—Army has been unhappy over the situation since last fall when Tactical Air Command (then located close to Army Field Force headquarters at Langley Field, Va.) was relieved of its combat air groups and made a subordinate unit of the Continental Air Command. Lieut. Gen Edwood (Pete) Quesada, TAC commander, was transferred to USAF headquarters. Quesada had been active in organizing joint training maneuvers with both Army and Navy and had sent TAC pilots to fly off Navy carriers in Atlantic fleet maneuvers.

In recent testimony before the Senate Appropriations Committee, Army Chief of Staff, Gen. Omar Bradley pointed out that the Marines enjoyed an air support of 21 squadrons for two ground divisions. Bradley said this was more air support than the army had ever had in World War II except on the Normandy beachhead. Bradley indicated that the Army had been putting steady pressure on USAF to increase its tactical air support elements during a series of conferences in the past several months. He said some progress had been made but there were still points of difference.

USAF Peddles Jets.—USAF has been interested in peddling its obsolescent jet fighter types as tactical air support planes while the Army is interested in a design competition for a new type ground support plane tailored specifically to its requirements. Tactical evaluations were also made of the Douglas Skyraider (AD) and Martin Mauler (AM) series, both Navy carrier-based attack planes



Official U. S. Marine Corps Photograph

WHEN A FELLER REALLY NEEDS A DIVE-BOMBER

U. S. Marines storming a beach in the Pacific, under support of Marine dive-bombers. The U. S. Army, unhappy over its own lack of tactical air support, points out that the Marines enjoy the comforting tactical support of 21 squadrons for every two divisions.

packing a heavy armament of cannon, rockets and bombs. USAF rejected these types because of their lack of speed when compared with jet types.

Indications are now that USAF has at least partially sold the Army on the performance of jet fighters as ground support planes. Top Army brass has indicated they were surprised at the accuracy of dive-bombing and strafing by the Lockheed F-80 and Republic F-84 but they are still skeptical about these planes' ability to pick up pinpoint targets at speeds of over 500 mph. and their lack of range which restricts the time they can spend in a target area.

Next generation of possible ground support planes would include the McDonnell

F-88, Lockheed F-90, both twin jet penetration fighters and the Martin XB-51 triple jet light bomber.

The new Tactical Air Force has no definite combat units assigned as yet. Its initial role will be to co-ordinate USAF-Army training maneuvers. It is likely that for initial ground-air training maneuvers it will get combat groups from Continental Air Command on temporary loan. USAF is also studying Army requirements for mass movement of ground troops by air over 3000-mile hauls.

British Refuel Jet Fighter in Flight

Manchester *Guardian*, Aug. 9.—The tactical powers of jet fighter aircraft have been greatly extended as a result of the develop-

ment of flight refuelling which ended yesterday with a continuous flight of 12 hours 3 minutes by a Gloster Meteor. The aircraft, powered by two Rolls-Royce Derwent I jet engines, was flown by Mr. P. Hornidge from Tarrant Ruston airfield, Dorset.

The tanker aircraft was a converted Lancaster III bomber. The Meteor carried a long hollow spear attached to its nose, and the Lancaster trailed the refuelling pipe behind it with a large cone on the end. When Mr. Hornidge wished to refuel he flew up behind the Lancaster and "speared" the center of the cone with the projection on his own machine.

This projection is called the "probe." Directly the probe enters the cone and takes the air pressure off the cone an automatic locking device grips it, a valve opens, and fuel flows from the tanker to the fighter. The fighter pilot breaks the link with the tanker simply by throttling down; air pressure then again comes into play on the cone and the hose is automatically released.

HELPED BY RADAR

The refuelling operation took place ten times to-day, every time without a hitch, although the latter part of the flight was made in rain and cloud and the interception of the fighter by the tanker aircraft had to be assisted by radar.

This is an entirely British development, for which Sir Alan J. Cobham has been largely responsible. He developed flight fuelling first of all as a means of improving the commercial returns from transport aircraft, for it enables much greater loads to be carried. It was proved successful in this capacity during tests over the Atlantic made by B.O.A.C., but as yet none of the State corporations has said what it intends to do about using the method.

Jet fighters have a very limited duration in the air, because of the high consumption of the jet engines. They are, therefore, hampered in such duties as escort work. With the new method of refuelling, jet fighters will be able to stay in the air for any length of time which the tactical situation dictates.

Jet Airliner's Initial Test Flight

New York Times, July 28.—Hatfield, England, July 27.—Britain's "trump card"

in the world race for commercial air supremacy, the de Havilland Comet jet airliner, appeared publicly for the first time here today and successfully made its first flight. Piloted by de Havilland's chief test pilot, Group Capt. John (Cat's Eyes) Cunningham, World War night fighter ace, the conventionally streamlined ship with swept back wings rose to 8,000 feet then flew at 100 feet over the de Havilland airdrome here for the benefit of the company's employees.

According to Captain Cunningham the new craft, with which Britain hopes to revolutionize long-distance commercial flying, "was very nice to handle" and the flight was entirely successful. Captain Cunningham said the four de Havilland Ghost engines, each with 5,000 pounds static thrust, had performed perfectly.

Earlier in the day Captain Cunningham, with a crew of four, had given the Comet its first serious taxiing tests and had lifted the plane to six feet over the ground for a distance of 500 yards at 100 miles an hour. The Comet was completed Monday after two years and ten months of intensive building in strict secrecy to protect it from commercial "pirating."

De Havilland officials declined to reveal details but from near by it is apparent that the plane has a conventional cigar-shaped fuselage with a tricycle landing gear and a low wing swept back at approximately a twenty-five-degree angle.

When the Comet goes into commercial operation—the estimated date is 1952—it is expected that it will carry thirty-six passengers in a pressurized cabin at 40,000 feet and at a speed of 500 miles an hour.

Noticeable among the features of the plane is that the four ghost jet engines have virtually been buried inside the radically thin wing. This affords the direct entry of air to the compressors through the front spar of the wing and it also gives additional benefits in the way of fire prevention, anti-icing of the engine bay, and the elimination of an extra installation.

Company officials said that two to three years' work remained to be done before the craft might be considered as a standard commercial airliner. In the meantime, they said that construction would be continued on sixteen Comets already on order, of which

the first two are for the Ministry of Supply with the remainder allotted to the British Overseas Airways Corporation and the British South American Airways.

Air Operations in Malaya

The Aeroplane, July 29.—In the constant war against armed insurgents in Malaya, operations by the R.A.F. have increased in strength over the past few months. Difficult terrain hampers the movements of ground troops, but by close liaison R.A.F. aircraft have used their mobile fire-power to good effect. These operations have shown close air support at its best, and have involved tactical reconnaissance, supply dropping and ground strafing.

Spitfire F.R. 18's have recently made many armed reconnaissance sorties over remote areas in South-East Pahang with the object of raising local morale and to deter insurgents.

Between June 24 and July 25, Dakotas have dropped about 80,000 lb. of supplies and rations to units operating deep in the jungles of Malaya. Drops have been made over a wide area, ranging from Johore in the South to Kedah in the North. The accuracy of dropping in difficult country is best illustrated by the fact that, of 223 packs dropped since July 1, only four containers have not been recovered for technical reasons. Other operational flights have included routine air-sea patrols, air-lifts of police and military personnel, and a search for a lost patrol in the jungle.

On July 15, aircraft made a 24-hour series of attacks in an extensive and dense area of mountainous jungle East of the Grik Leng-gong Road in Perak, where concentrations of bandits were known to be based.

Beaufighters delivered shallow-dive attacks with rockets, cannon and machine-guns, and Sunderlands made methodical bombing runs from several thousand feet with large numbers of fragmentation bombs. These latter aircraft also brought their gun turrets into action, machine-gunning the sides of valleys and ravines. During the hours of darkness, the precision and dive-bombing was maintained by the dropping of flares.

In warfare of this type as was proved by the Russians, small aircraft can be as valuable as any, and in Malaya the sturdy Har-

vard has been given a respite from its long-standing training duties and pressed into aggressive action. Its wing-mounted Brown-ing machine-guns are supplemented by clusters of fragmentation bombs for ground strafing.

On the following day Harvards were again used, and the A.O.C. Malaya, Air Vice Marshal F. W. Mellersh, flew on a strike in one of these aircraft, accompanied by Major-General D. Dunlop, G.O.C. Singapore District. Spitfires, Harvards and Sunderlands flew in five waves from their bases in Singapore and made prolonged attacks in the Tangkak District, West Johore.

MERCHANT MARINE

New Wartime Merchantman Bid to Ingalls

New York *Herald Tribune*, Aug. 15.—Ingalls Shipbuilding Corporation, Pascagoula, Miss., today bid \$4,864,000 to construct a new-type successor to the wartime liberty ship as the backbone of the American merchant fleet.

Its proposal was the lowest submitted to the Maritime Commission by eight companies which offered to construct the vessel.

In announcing plans to build the new ship, the Maritime Commission said the vessel will form the "prototype for large scale ship-building in any future national emergency."

NEWPORT YARD RUNNER-UP

The new ship will approximate the size and weight of the war-famed Liberty and Victory ships. About 10,000 tons, the vessel, however, will embody post-war developments in ship design.

(EDITOR'S NOTE: See Notes in JUNE PROCEEDINGS.)

More Liberty Ships to Store Grain

New York *Herald Tribune*, Aug. 13.—The Department of Agriculture yesterday requested the Maritime Commission to provide twelve additional laid-up Liberty ships for use as floating Hudson River grain warehouses. Completion of loading operations on the first dozen grain Liberties was announced at the same time by a New York commission spokesman.

Each group of twelve ships can hold 3,200,000 bushels of grain weighing 85,000

tons. Most of the ships used are taken from the commission's temporary reserve fleet site in Tomkins Cove, on the Hudson River, to Pier 15, Stapelton, S. I., for fumigation. Loading of grain is done from New York's unique floating grain elevators at various railroad piers on the Jersey shore.

The decision to use ships as grain warehouses, described as "expensive" by the commission spokesman, is one of several steps taken recently by the government to cope with a critical storage scarcity. The Commodity Credit Corporation, which runs the government's farm price support program, is responsible for loading and unloading the grain and for the cost of the entire operation, including towing and preparation of ships.

The Agriculture Department proposes to store the surplus grain for a ten-to-twelve-months' period. The Tomkins Cove site is the only laid-up fleet location on the East Coast with depth great enough to accommodate grain-loaded vessels. Since the grain is loaded only in the lower holds of the Liberties, the draft is approximately twenty-two feet. A fully-loaded Liberty sinks to a twenty-seven-foot depth.

Ile de France Modernized

Marine News, June, 1949.—When the *Ile de France*, luxury liner of the French Line, arrives in New York on her post-war maiden voyage on July 27 she will not look like her old self. Her friends who get an opportunity to see her before she departs on the return voyage to Plymouth and Le Havre on July 30 will hardly recognize her.

Stripped to the hull, after having served as a troop carrier, the long popular North Atlantic passenger liner has been transformed so that she will exceed even her former self in luxury, passenger comforts and technical improvements. The port holes are virtually all that remain of her pre-war passenger installations.

The familiar three-funnel silhouette of the original "*Ile*," has given way to two streamlined stacks equipped with devices to divert smoke from the aft part of the ship. This, together with the re-designing of the closed-in upper decks and the open promenade decks, will give the ship an entirely new appearance.

While changes in the new *Ile de France* will be most apparent in her appearance, the technical transformations are equally drastic. The engines and boilers have been rebuilt. Every foot of electric wiring and cable has been removed and three new vertical distribution systems, completely independent of each other, have been installed. Throughout the ship every precaution has been taken to prevent fires and the most modern equipment for fire detection and fire fighting has been installed. All the fire detection and alarm circuits are centered in a main control station manned at all times by a fireman detail.

The *Ile de France*, launched March 14, 1926, made her maiden voyage to New York on June 22 of the following year. Up to September, 1939 she carried 245,000 passengers in 346 crossings of the Atlantic. During her war and post-war repatriation services, for which she received the Croix de Guerre with Palms, she carried nearly half a million troops.

SCIENCE

Navy's New Aeroballistic Range

Aviation Week, Aug. 8.—Progress in aeronautical research demands, first of all, progress in the design, construction and operation of research equipment. In this respect, the United States is easily a decade ahead of the rest of the world. But this was not so prior to V-E Day, when Germany led the world by a safe margin.

Our scientists are only now beginning to move out ahead of where the Germans were more than four years ago. It has taken that long to improve and, in many cases, to duplicate the equipment and techniques in use or planned by the Nazis.

Missile Range.—An important example of such German-conceived equipment is the pressurized aeroballistic range recently dedicated at the new Naval Ordnance Laboratory, White Oak, Md., near Washington, D. C.

This device consists, essentially, of a sealed tube three feet in diameter and 300 ft. long, down the length of which a model missile is fired. Along the length of this tube are 25 camera stations which photograph the

missile in three dimensions as it progresses down the tube.

Importance of the NOL version of this unit is that it can be pressurized to six atmospheres or evacuated to a pressure of only 0.001 atmosphere, providing a wide range of Reynolds numbers for tests.

Supplements Tunnels.—The new aeroballistic range is intended to be used in conjunction with the Kochel wind tunnel now in operation at the Laboratory to check and amplify wind tunnel test results. Its pressure range from a near-vacuum to six atmospheres greatly extends the range of the data to determine exact Reynolds number effects at speeds up to 5,000 mph.

The new range combines features of the wind tunnel, the free-fall method and the rocket test method all in a single facility and thereby comprises an important new research tool that complements existing equipment and extends the range of data available into new areas.

Rocket Tests Due at 75-Mile Height

New York *Times*, Aug. 14.—As part of its program for the perfection of guided missiles, the Air Force will start next week a series of additional tests to determine the character of the atmosphere up to 75 miles above the earth's surface, it was announced today. The tests will last over a period of two years.

Upper atmosphere studies have been under way for some time at the Army Proving Ground at White Sands, N. M., with the cooperation of the Navy and the Air Force. German V-2 rockets have been sent aloft. The new series of firings will use sixty "Aerobee" rockets, developed by the Navy. The first firing will take place Tuesday at Almagordo, N. M.

The "Aerobeas" will carry electronic recording instruments, which will be released with ribbon-type parachutes at the zenith of the rocket's flight. This method of recovery is employed in the White Sands tests as well.

The instruments will record temperature, pressure, humidity, radio propagation characteristics and other atmospheric qualities.

The various instruments will weigh about 200 pounds. Some of them will be of the self-recording type, while others will transmit in flight to receiving instruments on the ground.

Some thirty different educational and research institutions will take part in the two-year program, each one loading the instruments aboard at least one of the rockets to be fired, and then evaluating the recordings.

"When all the data from this upper-atmosphere research program have been evaluated," today's announcement said, "they will be used by the Air Force in evolving the design of guided missiles, in determining the relation between solar activity and weather changes, and as basic atmospheric information to be used in the guided missiles program."

The "Aerobee" is about twenty feet long and a little over a foot in diameter, with three stabilizing fins. Propelled by a liquid fuel, it can reach an altitude of more than seventy-five miles and has attained a speed of nearly 3,000 miles an hour.

Designed by the Aerojet Engineering Corporation and the Douglas Aircraft Company, the rocket was developed under the technical supervision of the Applied Physics Laboratory of Johns Hopkins University, at Silver Spring, Md.

The rocket was first fired at the White Sands Proving Ground on March 5, 1948. Five months ago two were fired from the deck of the U. S. S. *Norton Sound* off the coast of South America.

Composition of the atmosphere above 100,000 feet, the height to which meteorological balloons rise, is relatively unknown.

The Air Force's research program is being conducted under the direction of the Geophysics Laboratory of the Air Materiel Command's Cambridge Field Station, Cambridge, Mass.





Official U. S. Coast Guard Photograph

ABOARD THE COAST GUARD CADET TRAINING SHIP *EAGLE*

A definitive history of the U. S. Coast Guard is one of the important new books the Naval Institute is publishing this fall.



Change in Board of Control

At its last monthly meeting the Board of Control accepted with great regret the resignation of Rear-Admiral W. N. Thomas (Ch.C.), U. S. Navy, due to the forthcoming retirement of Admiral Thomas from active duty. In his stead the Board elected Captain Arleigh A. Burke, U. S. Navy, at present on duty in the Navy Department, Washington, D. C.

Naval Institute Calendars

Attention of all members is called to the Naval Institute's "Old Ironsides" Calendar for 1950 which is now available. Consisting of a large calendar pad with calendar, and a large memorandum pad, the whole inclosed in a handsome, durable cover embossed with a reproduction of the famous U.S.S. *Constitution* under full sail, the calendar is not only handy for personal use, but makes one of the most attractive, inexpensive gifts that one can give. The price of complete cover, calendar pad, and memo pad is only \$1.00 postpaid to Institute members and \$1.50 to non-members. If you already have the cover, you may order the 1950 calendar pad for 25 cents and the memo pad for 15 cents. The "Old Ironsides" calendar is a lifesaver at Christmas time when you have to think up those dozen or more last-minute gifts. Many of our members purchase dozens of these calendars each year, and one member orders several hundred every year!

More Institute Books

Mention has been made in recent issues of the great expansion of the Institute's book publishing activities. In addition to *U. S. Submarine Operations in World War II*, which is described at length on page 1127 of this issue, the Institute has just published *Round-shot to Rockets*, a history of the Washington Navy Yard and Naval Gun Factory. Details of this unusual and fascinating book will be found on page 1165 of this issue. Another new Institute book is *Naval Leadership*, an authoritative book on this subject prepared under the supervision of the Superintendent of the U. S. Naval Academy. It will be used extensively in officer training, both at the Naval Academy and in the Navy's various training activities. Regular retail price is \$3.00 per copy postpaid, but special price to Institute members is \$2.25 per copy, postpaid.

Of interest not only to U. S. Coast Guard personnel but also to all other branches of the services is the Institute's new book *The United States Coast Guard, 1790-1915—A Definitive History (with a postscript: 1915-1949)*, by Captain Stephen H. Evans, U. S. Coast Guard. The retail price of this book is \$5.00 per copy, postpaid, but to Naval Institute members a special price of \$3.00 per copy, postpaid, is made.

U. S. Submarine History

Since printing the first notice of the forthcoming book, *United States Submarine Operations in World War II*, we have received hundreds of orders. To enable our readers still to obtain the book at the special prepublication price of \$5.00, postpaid, we are reprinting the prepublication offer in this issue. Orders will be filled as soon as the books are received from the printer—November 1st or shortly thereafter.

Special Notice

U. S. Naval Institute General Prize Essay Contest, 1950

A PRIZE OF NOT LESS THAN \$500 and of not more than \$1,500, a gold medal, and a life membership in the Institute will be awarded for the best essay submitted on any subject pertaining to the naval profession, should the Board of Control consider the essay to be of sufficient merit. Should the prize be awarded to a previous winner, a gold clasp suitably engraved will be given in lieu of the medal and the commuted value of the life membership in lieu of the life membership.

Irrespective of the award of the "Prize," one or more essays may receive "Honorable Mention," if of sufficient merit to justify the award. Essays awarded "Honorable Mention" shall receive such compensation as may be adjudged by the Board of Control, but not including a life membership.

In the event that no essay is adjudged of sufficient merit to receive the "Prize" or an "Honorable Mention," the best essay submitted may receive a special award in lieu thereof.

The following rules will govern this competition:

- (1) Essays should not exceed 8,000 words.
- (2) Essays must be received by the Secretary-Treasurer on or before January 1, 1950.
- (3) The name of the competitor shall not appear on the essay, and each essay must have a motto in addition to the title. This motto shall appear (a) on the title page of the essay, (b) on the outside of a sealed envelope containing identification of the competitor, (c) above the name and address of the competitor inside the envelope containing this identification. This envelope will not be opened until the Board has made the awards. Essays and identifying envelope must be mailed in a large sealed envelope marked "General Prize Essay Contest."
- (4) The awards will be made by the Board of Control, voting by ballot and without knowledge of the names of the competitors.
- (5) The awards will be made known and presented to the successful competitors as soon as practicable after the February meeting of the Board.
- (6) All essays must be typewritten, double spaced, on paper 8½" x 11", and must be submitted in triplicate, each copy complete in itself.
- (7) Essays awarded the "Prize," "Honorable Mention," or "Special Award" are for publication in the Naval Institute PROCEEDINGS. Essays not awarded a prize may be published at the discretion of the Board of Control, and the writers of such essays shall be compensated at the rate established for articles not submitted in competition.
- (8) Attention of contestants is called to the fact that an essay should be analytical or interpretive and not merely an exposition or personal narrative.

William G. Cooper,
Captain, U. S. Navy, Secretary-Treasurer

UNITED STATES NAVAL INSTITUTE PROCEEDINGS

*For the advancement of professional, literary and
scientific knowledge in the Navy*

November, 1949

Edited by CAPTAIN W. G. COOPER, U. S. NAVY

Managing Editor—COMMANDER ROY DE S. HORN, U. S. NAVY (RET.)

Associate Editors

CAPTAIN JOSEPH M. P. WRIGHT, U. S. NAVY

COMMANDER C. P. LEMIEUX, U. S. NAVAL RESERVE (INACTIVE)

LIEUTENANT COMMANDER H. O. WERNER,
U. S. NAVAL RESERVE (INACTIVE)



United States Naval Institute

Publication Office: Menasha, Wisconsin

Editorial and Business Office: Annapolis, Maryland

Advertising Department: 2000 Connecticut Ave. N.W., Washington, D.C.

Copyright, 1949, by U. S. Naval Institute

Officers of the Institute

PresidentADMIRAL LOUIS E. DENFELD, U. S. NAVY
Vice-PresidentREAR ADMIRAL JAMES L. HOLLOWAY, JR., U. S. NAVY
Secretary-TreasurerCAPTAIN W. G. COOPER, U. S. NAVY

Board of Control

ADMIRAL LOUIS E. DENFELD, U. S. NAVY (ex officio)
REAR ADMIRAL JAMES L. HOLLOWAY, JR., U. S. NAVY (ex officio)
REAR ADMIRAL ELLIS REED-HILL, U. S. COAST GUARD
REAR ADMIRAL JOHN W. ROPER, U. S. NAVY
CAPTAIN ARLEIGH A. BURKE, U. S. NAVY
CAPTAIN M. A. SAWYER, U. S. NAVY
CAPTAIN ROBERT B. PIRIE, U. S. NAVY
MAJOR JOHN E. WILLIAMS, U. S. MARINE CORPS
CAPTAIN W. G. COOPER, U. S. NAVY (ex officio)

Past Presidents

ADMIRAL DAVID D. PORTER, U. S. NAVY, 1873
REAR ADMIRAL JOHN L. WORDEN, U. S. NAVY, 1874
REAR ADMIRAL C. R. P. RODGERS, U. S. NAVY, 1875-78
COMMODORE FOXHALL A. PARKER, U. S. NAVY, 1878-79
REAR ADMIRAL JOHN RODGERS, U. S. NAVY, 1879-82
REAR ADMIRAL C. R. P. RODGERS, U. S. NAVY, 1882-83
REAR ADMIRAL THORNTON A. JENKINS, U. S. NAVY, 1883-85
REAR ADMIRAL EDWARD SIMPSON, U. S. NAVY, 1885-87
REAR ADMIRAL STEPHEN B. LUCE, U. S. NAVY, 1887-98
REAR ADMIRAL WM. T. SAMPSON, U. S. NAVY, 1898-1902
REAR ADMIRAL H. C. TAYLOR, U. S. NAVY, 1902-1904
REAR ADMIRAL C. F. GOODRICH, U. S. NAVY, 1904-1909
REAR ADMIRAL RICHARD WAINWRIGHT, U. S. NAVY, 1909-11
REAR ADMIRAL BRADLEY A. FISKE, U. S. NAVY, 1911-23
VICE ADMIRAL WILLIAM L. RODGERS, U. S. NAVY, 1923-24
ADMIRAL HENRY B. WILSON, U. S. NAVY, 1924-26
ADMIRAL HILARY P. JONES, U. S. NAVY, 1926-28
REAR ADMIRAL EDWARD W. EBERLE, U. S. NAVY, 1928-29
ADMIRAL S. S. ROBISON, U. S. NAVY, 1929-31
REAR ADMIRAL M. L. BRISTOL, U. S. NAVY, 1931-33
ADMIRAL WILLIAM H. STANDLEY, U. S. NAVY, 1933-35
ADMIRAL DAVID FOOTE SELLERS, U. S. NAVY, 1935-37
FLEET ADMIRAL WILLIAM D. LEAHY, U. S. NAVY, 1937-40
ADMIRAL H. R. STARK, U. S. NAVY, 1940-42
FLEET ADMIRAL CHESTER W. NIMITZ, U. S. NAVY, 1942-43
FLEET ADMIRAL E. J. KING, U. S. NAVY, 1943-46
FLEET ADMIRAL CHESTER W. NIMITZ, U. S. NAVY, 1946-48

November

Contents

1949

Vol. No. 75, No. 11

Whole No. 561

For the Advancement of Professional, Literary, and Scientific Knowledge in the Navy

U. S. MIGHT IN THE MEDITERRANEAN—THE CARRIER *Philippine Sea* AND AN
ESCORTING CRUISER IN HISTORY'S SEA OF DESTINY. *Front Cover*
Official Department of Defense Photograph

BY THE ROCKET'S RED GLARE: INVOKERN. 1207
By Lieutenant Warren R. Hughes, United States Naval Reserve (Retired)

THE NATIONAL MILITARY ESTABLISHMENT AND DOLLARS. 1217
By Captain J. E. Hamilton, U. S. Navy

THE "MOGAMIS": CHEAT CRUISERS EXTRAORDINARY. 1229
By Warren S. Howard

NAVY COLD WEATHER CONSTRUCTION ENGINEERING. 1233
By George W. Grupp

U. S. NAVAL AIR BASES FROM 1914 TO 1939. 1243
By Dr. Ivor D. Spencer

THE NAUTICAL MILE. 1257
By Lieutenant Commander Alton B. Moody, U. S. Naval Reserve

OUR FIRST IRON MAN-OF-WAR. 1263
By Captain Frederick L. Oliver, U. S. Navy (Retired)

EARLY JAPANESE IMPERIALISM AND THE PHILIPPINES. 1267
By James K. Eyre, Jr.

MARINE CORPS AVIATION—AN INFANTRYMAN'S OPINION. 1277
By Major J. N. Rentz, U. S. Marine Corps Reserve

THE SEABEES (*Pictorial Section*). 1281

DISCUSSIONS, COMMENTS, NOTES. 1293

BOOK REVIEWS. 1297

PROFESSIONAL NOTES. 1303

SECRETARY'S NOTES. 1321

The opinions or assertions in the articles are the private ones of the writers, and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

Published monthly at 450 Abnapp St., Menasha, Wis.
Executive, Editorial and Business Offices, U. S. Naval Institute, Annapolis, Md.
Advertising Department, Suite 710, 2000 Connecticut Ave., N.W., Washington, D.C.
Entered as second-class matter at the post-office at Menasha, Wis., April 4, 1922, and at the post-office at Annapolis, Md., under Act of August 4, 1912. Acceptance for mailing at the special rate of postage provided for in section 1103, Act of October 3, 1919, authorized March 13, 1922.
Membership dues (including *Proceedings*), \$2.00 a year.
Subscription rate, \$4.00 a year. (Foreign postage, \$1.00 extra.) Single copies 50 cents.



**NOW ON
FLEET
DUTY!**

In striking effectiveness and speed, the Douglas AD-Skyraider line of dive and attack bombers is meeting the highest requirements of national defense. The result of nearly two decades of attack development by Douglas, the *Skyraider*, like its predecessor the SBD *Dauntless*, is famed for top performance and dependability under all operating conditions. Today the *Skyraider* is in volume production at the El Segundo Plant of Douglas for the U. S. Navy.

DEPEND ON DOUGLAS





Ships of the Navy



... Ahead of Schedule

Never before World War II has Industry performed such feats of production . . . a record that created the greatest Navy of all time.

The achievements of New York Ship in this program were equally outstanding. From January 1,

1940, the Yard developed complete designs for seven classes of major combatant ships, twenty-nine of which were built at the Yard and delivered eight to thirteen months ahead of contract dates.

NEW YORK SHIPBUILDING CORPORATION

CAMDEN, NEW JERSEY



Official U. S. Navy Photograph

THE 1500-FOOT MISSILE LAUNCHER AT INYOKERN

Along the whole length of the single track launcher a battery of scientific instruments observes the speeding missile for initial velocities, acceleration, and terminal ballistics.

UNITED STATES NAVAL INSTITUTE PROCEEDINGS

Vol. No. 75, No. 11

NOVEMBER, 1949

Whole No. 561

BY THE ROCKET'S RED GLARE: INYOKERN

By LIEUTENANT WARREN R. HUGHES, *United States Naval Reserve (Retired)*

THE Naval Ordnance Test Station, near Inyokern, California, is one of the largest establishments under the cognizance of the Bureau of Ordnance. The station, about one hundred and fifty miles north of Los Angeles, covers more than a thousand square miles of plains and mountains. Its bounds spread twenty-six miles from east to west and forty-seven miles from north to south. The station is more than three times greater in expanse than the combined areas of the European countries, Lichtenstein, Monaco, San Marino, and Andorra. The Grand Duchy of Luxembourg is smaller than the Navy's desert installation.

But its tremendous size is not the Inyokern station's chief claim to fame. It is one of the most spectacular developments of modern times, and it is one of the leading primary research centers operated by the Bureau of Ordnance. How the station came into existence and grew into an unparalleled research facility; what vital development work has been undertaken there; and how it is pushing forward in new fields of scientific research—all combine to make the Naval Ordnance Test Station one of the most significant shore establishments today. Its scientific approach typifies the dynamic quality of weapons development in the modern Navy. The full impact of its work has not yet been felt throughout the service; many of the naval weapons of the future are its research projects today.

In early days of World War II, the United States was behind other powers in the field of rocket warfare. Germany, Russia, and Great Britain ranked ahead of the United States in rocket developments. The Germans had begun intensive research in the field of unconventional weapons as early as 1936, had designed V-2 by 1939, and saw it successfully fired by 1942. There was a frightening urgency in our catching up.

The Office of Scientific Research and Development contracted with the California Institute of Technology to undertake research and development of rocket powered weapons. Dr. C. C. Lauritsen, a World War I rocket specialist who had been helping the British in their weapons development program, returned to the United States to head the Institute's research project. First tests of the new missiles were made in mid-1942 at Goldstone, a dry lake in the desert about fifty miles southeast of the present station. For extensive testing, however, more room than that available at Goldstone was needed.

A site committee was formed. The group searched about for a location which offered a wide expanse of relatively unpopulated area, close to research facilities in Pasadena, near a railroad and good highways, with water, power, and other utilities available, and finally, near an adequate labor supply. The Inyokern area possessed the greatest advantages, fulfilling all requirements for the station except that of labor supply. The

AN HONOR graduate of the University of Texas, Mr. Hughes was commissioned in the Naval Reserve in 1942, and served on the Staff of Commander Service Force Pacific and in the U.S.S. *Pawnee* in the South Pacific Force. He later commanded the U.S.S. *Quapaw* and the *ATR-55*. He is a contributor to many well known magazines.

prospective location had an added advantage: flying is closed down because of weather in fewer than ten days per year. The group selected the site.

Officers of the Bureau of Ordnance played a leading part in October, 1943, in obtaining the land for the station. They hurriedly got in touch with authorities all over the country. Most of the area was public domain and came under the jurisdiction of the Department of the Interior; a small part belonged to the State of California; the Army had leased a part; the relatively few acres remaining belonged to homesteaders. Of the whole expanse of the base as first set up, only about 3000 acres were patented.

Title of public domain was transferred from Interior to Navy. The Army traded its leased airport for a marshy tract elsewhere to use for testing amphibious equipment. An exchange was negotiated with the State. Private lands were taken over under the Second War Powers Act.

The Navy helped homesteaders move—even moved shacks on occasion—to speed the development. A few settlers even moved twice as the station grew. Some were promised settlement for their land and improvements, while others, who wanted to stay, were given comparable lands, a water supply, and a cash settlement. Some were given jobs.

Mining claims in the Argus, Coso, and Sierra Nevada mountains were closed down. In at least one instance, that of the El Conejo Mine, even salt and pepper shakers filled and ready for use were left in the caretaker's house as the station came into existence and grew. There were, at the outset, about a thousand mining claims on the station's lands.

On November 8 the station was established. Secretary of the Navy Frank Knox, in the establishing letter, stated the mission

of the station as the "research, development, and testing of weapons, and having the additional function of furnishing primary training in the use of such weapons."

There was no skilled labor force available in the immediate vicinity; as a matter of fact there was no appreciable labor force of any kind in the sparsely settled valley. Most skilled workers, already busy in war plants in San Diego, Los Angeles, and San Francisco, could not be persuaded to leave the advantages of the city for the primitive accommodations then available at Inyokern.

To help alleviate the shortage of construction personnel, the U. S. Employment Service made a nationwide campaign for labor; contractors sent recruiting parties over the entire country offering to pay transportation to Inyokern in order to get more workers. A former Executive Officer, who served during much of the building of the station, says, "Almost anyone able to work was hired. There was a station to be built and to be built in a hurry!" Turnover was terrific. Twenty-four thousand men were employed during the first year, yet the peak number at work at any time was seven thousand.

Naval Officers and scientists assigned to the embryonic station coped with almost every conceivable problem while living under conditions which, at the very best, were hardly luxurious. In December, 1943, one slept near the station at Harvey Field in a Quonset hut which had neither windows nor doors. "I've slept in the snow in the High Sierras," he says, "but never have I seen such a cold place as that open-air Quonset!" The Commanding Officer shared his Quonset hut with the Executive Officer and the Experimental Officer. The hut was used not only as their living quarters but also as the administrative office of the base.

By winter of 1943 the first rockets, an American modification of a British development, were fired in the dry bottom of China Lake while the station was still essentially in its infancy. Sage and creosote bushes were removed to make way for buildings. By February 29, 1944, the station had eight Quonset huts. The base was being expanded. Suitable test ranges were being set up and rocket development was going apace.

Everything was done under pressure.



Official U. S. Navy Photograph

FROM DESERT TO METROPOLIS

From sagebrush and sand, the Naval Ordnance Test Station at Inyokern has grown to a complete city of 12,000 population. And the Station with its test ranges covers more territory than the country of Luxembourg in Europe.

Over a thousand separate projects of local or Bureau origin were undertaken during the war while the station was still being built.

The basic problem presented to the group of scientists working with the Inyokern establishment was to devise methods and apparatus for the dry extrusion of ballistite for rocket propellant grains. Pilot plants were built to develop propellants. Means were worked out to retard the speed of burning solid rocket fuels, and the group then proceeded to undertake the development of a number of tremendously effective new weapons.

One resulted in a missile known as "Holy Moses," a five inch high velocity aircraft rocket conceived by scientists of the California Institute of Technology. The missile grew from an early design utilizing a five-inch gun projectile and a three and one-half inch rocket motor. A new five-inch motor increased its velocity by more than twenty per cent; the result, in the words of a bystander who witnessed test firings—"Holy Moses!" Mass produced, the weapon was used in the Pacific against Japanese pillboxes and factories. In Europe it was used against rail and motor transport and helped break

up the Battle of the Bulge.

"Tiny Tim," another Inyokern development, was, when built, the largest aircraft rocket produced in this country. An 11.75-inch weapon that looks something like a torpedo, Tiny Tim weighs slightly more than half as much as a torpedo. Its speed, accuracy, penetration, and bursting power are phenomenal.

Data on velocity, range, dispersion, sighting, and handling were worked out at Inyokern. These records are all the more noteworthy when one considers that the United States was a babe in arms insofar as rocket research was concerned, and that facilities were just being built.

Some problems of rocket development required the application of advanced physical and mathematical theory; some required an entirely practical solution. One would not want to light the fuze of a Fourth of July skyrocket and leave his hand in the path of the burning propellant as the rocket zooms skyward. A similar problem had to be faced with large airborne rockets. No one knew as a practical matter just how far a rocket must be from the airplane fuselage to avoid burning the launching plane. No one knew exactly the effect that rocket propellant blasts would have on ailerons, fins, and rudders of firing aircraft. The *swoosh* of the propellant might throw the plane out of control or toast it to a crisp. Planes were run up on ramps that looked like automobile grease racks, and rockets were fired at various intervals below them to find the optimum distance. Other planes were hoisted in the air with a boom, and similar experiments were run. "We got a few scorched tails out of the deal," one experimenter says, "but we found what we needed to know in the most practical tests we could rig."

Then, knowing how far below the plane to fire a large rocket like Tiny Tim, they worked out means of firing it at that point. The first launcher worked like a swinging trapeze. The trapeze would swing downward, and at the bottom of the swing a microswitch would fire the rocket. Sometimes, however, firing would not occur at the exact bottom of the arc; a moment's delay would give the missile an upward tilt. "It's very unhandy to have a Tiny Tim go through the propeller," a

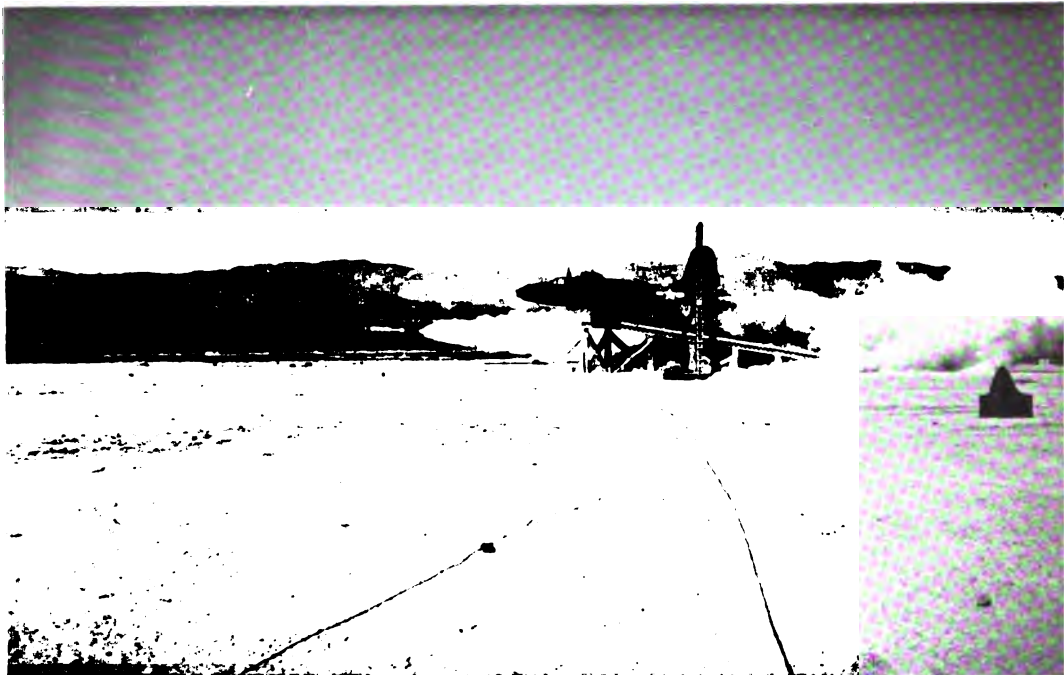
former Executive Officer says, "especially if you happen to be the pilot." A new launching device was worked out. Now, in effect, the rocket is simply dropped like a torpedo and fired by lanyard a few feet below the fuselage.

Because certain unconventional weapons were fitted with classified mechanism, security required that some of these missiles be recovered. Several, apparently under the impression that they really belong to the mole family, buried themselves deep in the sand, requiring Inyokern men to dig perhaps forty feet deep to remove them. Only small bulldozers were available for the job; larger ones went to advanced bases. Using a T-9 bulldozer, which compares to larger types as a four-cylinder Ford does to a Mack truck, disposal men sweated, strained, and cursed as they removed as much as a thousand yards of earth to recover one missile. Everyone stayed busy around Inyokern.

Rockets for use against submarines; air-to-air missiles fitted with V-T fuzes, medium and high altitude anti-aircraft rockets; rocket propelled chemical weapons and anti-tank grenades: all these were turned out by the Inyokern scientific group. Using almost any type of portable firing platform—from jeep to small craft—barrage rockets could make the densest jungle as desolate as the Sahara. Rockets helped clear landing beaches of opposition; assault forces could hit the beach standing up; and countless American lives were saved because of the new weapons. The Director of Research for the Pacific Coast Group was awarded the Medal for Merit for his contributions and leadership.

To appreciate fully Inyokern's wartime job, the observer must keep one eye on scientific developments and the other on the expanding station. While unconventional weapons were being built and tested, buildings were springing up everywhere and asphalt roads were being laid out over the desert. A hot-mix plant was set up for building roads. To bring in supplies, Inyokern built its own ten-mile railroad.

Inyokern, a boom town in more ways than one, had no jail. The deputy sheriff collared a raucous worker one night, tossed the culprit into an empty boxcar, and locked him up for safekeeping. The next morning the deputy pursued the boxcar to Lancaster, 85



Official U. S. Navy Photograph

HOW FAR AWAY IS SAFE?

Test firing a rocket to determine the effect of the rocket exhaust flames on the firing plane.

miles away, to get his prisoner out of the wheeled calaboose. Despite difficulties, however, the vast program was successfully completed.

Prior to April, 1945, the facilities of the station were used primarily for the rocket program of the Bureau of Ordnance acting through Caltech (the California Institute of Technology) under its contracts with OSRD (the Office of Scientific Research and Development). Initial work toward establishing the station's own research and development program was commenced in January, 1945. This was a significant departure, for it marked the beginning of the station as an integrated agency for weapons development: all activities were coming under one roof, so to speak. From April through October of that year, activities of the OSRD group such as Caltech were largely absorbed by the permanent technical organization of the Naval Ordnance Test Station. Almost completed, the station required finishing touches. Projected scientific laboratories were yet to be built. Technical facilities were expanded for the integrated activity which, because of

its location, can collaborate effectively with the aircraft industry of Southern California and naval installations of the Pacific Coast area. The Naval Electronics Laboratory at San Diego and the Air Missile Test Center at Point Mugu, each relatively near-by, are particularly noteworthy in this respect.

Today the station represents a hundred million dollar investment in the future of new ordnance. Two thousand buildings have risen in what was once wasteland. The sun still shines hot in summer, but life is more pleasant now. Permanent buildings of modern desert-type architecture are air-conditioned, and three hundred miles of hard surfaced roads lead through the base where once only desert trails could be found. With facilities placed there for its 12,000 inhabitants, one could live a lifetime and never go beyond the gates of the station for any reason. Stores, barbershop, beauty parlor, dispensary, chapel, theater, library, schools, athletic fields, swimming pools, and banking facilities are in operation. Housing facilities are being expanded. New housing developments for both civilians and service persons

nel are being completed this year. Four thousand five hundred workers, about 900 of them service personnel, are manning Inyokern's offices, laboratories, and ranges. Normally about 115 officers are assigned to the station. Ship's service, commissary, and recreational privileges are extended to civilian personnel. An Officer's and Scientist's Club is maintained.

Cool evenings, fresh rarefied air, the vastness of the desert, and the facilities at hand make enthusiasts of those who work at Inyokern. A station newspaper builds up community spirit. Trees have been planted along thoroughfares and avid gardeners are transforming the housing area into a mass of greenery.

Nine ranges for test firing missiles surround the community, and an underwater ordnance adjunct has been set up near Pasadena. Some of the ranges, equipped with an array of scientific equipment, extend as far as thirty miles.

In firing test vehicles, a carefully devised firing routine is followed not only to insure maximum safety, but also to coordinate the operation of scientific equipment used in connection with experimental launchings.

In a typical test of a ground-fired missile, the "bird," as the winged missile is called, is made ready step by step; responsibility for synchronizing the precision measuring instruments falls upon the Range Engineer assigned to the operation. No one can enter the range area without his specific permission. Beginning thirty minutes before scheduled firing, he issues periodic warnings over the loudspeaker system; the sequence of voice warnings is supplemented by a variety of prearranged signals to bring telemetering, photographic, radar tracking, and other scientific information-collecting stations into operation at the exact instant of firing.

Telemetering is employed frequently in tests. Near the launching site, operators with spiral antennae pick up impulses on numerous frequencies assigned for the test. Information transmitted to the launching station by telemetering equipment within the body of the missile is analyzed to determine acceleration and other data.

Photographic crews are stationed at intervals along the edge of the range, and each

photographs certain assigned parts of the missile's trajectory with high speed astronomical cameras. Because Inyokern specialists are particularly interested in the first five seconds of a missile's flight, they break these few moments into as many component parts as possible. In effect, with precision cameras, they retard the speed of fast-flying missiles to a fraction of their actual speed. Permanent film records reveal information on each part of the flight. Triangulated, the film can be assessed to measure range, velocity, and other characteristics.

Radar tracking, including the use of a radar type which applies the Doppler Principle to the electromagnetic spectrum, is used along with other means to obtain ballistic characteristics. Applied to anti-submarine warfare, the Doppler effect is the change of pitch, that is, frequency, of the original *ping* and its returning echo; by observing the change, one may determine the relative movement of the underwater object. Radar application of the principle, essentially the same except that the change cannot be heard, is accurate enough to be used for calibrating air speed indicators on aircraft. Utilized in missile tests, the change of frequency indicates launching speed and acceleration factors.

Along the path of long launchers—one of them is fifteen hundred feet long—magnetic pickup installations determine original velocities and accelerations. The device, a series of magnetic circuit breakers, records the passing of a missile along its course, measuring speeds in thousandths of a second. Original velocity, having an effect upon the launcher and having much to do with a missile's ultimate range, has considerable significance; this is particularly true in staged, or two-part, missiles.

Photography is widely used to track airborne as well as other missiles. Standard gunsight aiming-point 16-mm. cameras are used to obtain slant range on air-to-surface firings, and the resulting pictures are evaluated by the sight camera film assessor, a device which was developed at Inyokern and which is the only one in existence. By means of a tilting and rotating table used with film projection, the aim point, dive angle, off-course angle, and degree of bank can be



Official U. S. Navy Photograph

"TINY TIM" PACKS A POWERFUL PUNCH

The 11.75-inch airborne rocket developed at Inyokern blasts its way through a series of thick concrete barriers.

computed. But for this device, small 16-mm. frames would have to be measured individually to compensate for variables in a test run. In a matter of minutes the true physical qualities of firing are read directly from the assessor.

To assess aircraft fire control equipment, the Naval Ordnance Test Station developed a moving target range. A rocket powered target zooms along a mile track faster than an amazed antelope. Aircraft approach at various angles of attack. With relative motion high, any desired cross wind can be developed. The entire operation is photographed and measurements are taken from the film to assess the precise effect of manufactured wind velocity. New aircraft fire control systems—an important factor with higher speed aircraft and new types of weapons—have been tested with the high velocity target.

The moving target device is also used to subject new designs to high accelerations under controlled conditions, making it, in effect, an open air wind tunnel. It is an inex-

pensive and reliable method of testing delicate mechanisms to be used in developmental models prior to subjecting them to actual launching accelerations. The one-mile track has proved so useful that a ten-mile track has been proposed for future use.

When a rocket powered car takes off down the railroad track, there is, of course, the problem of stopping it. In order to keep the high speed target from ending up somewhere in the mountains, a pre-set retro-rocket fires in the direction opposite to the line of travel as the target nears the end of the track, and the vehicle brings itself to a spectacular halt, with no harm done.

The analog computer, an electronic device for solving mathematical equations with variable factors, is used to figure ballistic data. "You might call it a super-speed electronic brain," one of the technical staff says. "There aren't enough trained people in the country to solve some of the ballistic problems as rapidly as they must be solved." Rigged for the desired formula, the computer can perform hours of work in a second.

Because there is no large body of deep water available at Inyokern, the station has an adjunct at Morris Dam near Azusa for testing underwater ordnance and for conducting studies of ballistic problems associated with the entry of solid bodies into water. A variable angle launcher, three hundred feet long, projects torpedoes and other missiles into the water for research on water entry, underwater mechanics, and underwater ballistics. The unit also has a long track for fixed-angle launching. Motion picture and still cameras make photographic records of each launching. The water ranges probably constitute the world's most outstanding installation of its type. Research data gathered there will allow designers to select projectile shapes for given operating conditions, to design them for known shock conditions, and to avoid discoverable causes for erratic behavior of missiles in water.

The Naval Air Facility, a subordinate command operating at Armitage Field within the bounds of the station, supplies air service for tests. With 9700-foot runways, the field can accommodate the largest aircraft. Specially equipped B-29's from this field have made high altitude tests to gather information for cosmic ray and night light studies under the direction of the Office of Naval Research. This project is in the realm of pure science.

Applied science, however, is the specialty of the technical group operating in Michelson Laboratory. So large that its floor space is measured in acres rather than in square feet—there are seven and a half acres of floor area within it—the laboratory is the most recent major addition to the station. One of its corridors is as long as a carrier deck.

Built at a cost of about \$8,000,000, the laboratory is said to be the most complete scientific research facility of its kind in the world. It is particularly fitting that the laboratory is named in honor of a graduate of the Naval Academy, Dr. A. A. Michelson, of the class of 1873, who in 1907 became the first American to win a Nobel Prize in physics.

The laboratory, air-conditioned and earthquake resistant, is regarded as virtually self sufficient for basic and applied research in

the sciences. Its heavy machine shop, foundry, heat treating plant, metallurgical X-rays, and other service facilities can turn out almost any type of ordnance component. Some of its equipment is the heaviest west of the Mississippi.

In one test chamber, scientists can make their own weather to order, with sun, ice, wind, rain, or various degrees of humidity; they can even create a sandstorm or heavy spray of salt water. In another chamber they can test ordnance under conditions of quick changes of altitude, temperature, and humidity.

Today the station answers all requirements for weapons development from initial research to the final product.

Bringing together civilian scientists, engineers, and naval personnel has brought forth a new type of organization specifically designed to meet Inyokern's requirements. The station organization provides for a Technical Staff and an Administrative Staff, each reporting to the Commander of the station.

The Navy provides a framework of administration and services. Scientific personnel carry out their work within that framework much as they would in an industrial or university laboratory. The Technical Staff, essentially the civilian scientific and technical element of the establishment, is headed by the Technical Director. He is responsible for the over-all direction of the research and development program. To supply the benefits of operational experience to the technical group, naval officers with strong qualifications in research and development fields work alongside civilian scientists. The Experimental Officer, for example, serves as advisor to the Technical Director and as military liaison between the Commander of the station and the technical organization.

Exact information on weapons development at Inyokern today is, of course, subject to security regulations. Speaking before the Navy Industrial Association in the Fall of 1947, the Technical Director stated that the development program of the station includes (1) rockets for air-to-air and air-to-ground application, (2) guided missiles and missile components, (3) underwater ordnance and missiles for underwater attack, and (4) air-



Official U. S. Navy Photograph

DIGGING FOR A "TOP SECRET" FUGITIVE

Highly secret experimental missiles must be recovered, even though 1,000 yards of earth have to be removed to recover them.

craft fire control systems for projection of airborne rockets, bombs, gun projectiles, and torpedoes.

Guided missiles, in themselves, are not too mysterious. A guided missile has been defined as "an unmanned vehicle moving above the earth's surface, whose trajectory or flight path is capable of being altered by a mechanism within the vehicle." Acoustic homing torpedoes, except for their operating in a different medium, would be guided missiles. The adaptation of rockets, which we have, and ramjets, which we have, into guided missiles of extended range is principally a problem of increasing their range with lighter, slower-burning fuels, building an air-frame that will not be destroyed by the burning of the fuel, and giving them guidance.

It is logical to assume that the Navy needs a guided missile of medium range (taking the popular figure of 5,000 miles as long range) for sea bombardment of coastal and inland industrial targets within an aggressor nation. With the U.S. Navy controlling the seas, vessels such as the *Kentucky*, *Hawaii*, or

guided missile submarines could reduce the aggressor's warmaking potential in much the fashion that industrial targets in Japan were reduced by highly accurate shore bombardment. Accuracy and considerable range, of course, are essentials of a guided missile capable of removing the capacity to wage war. Fast firing short range weapons would be required for sea warfare.

How soon and how well the problems of light weight fuels, temperature resistant metals and other factors of long range propulsion are to be solved are questions of the hour.

Whether we use sound, heat, light or some other phenomenon as a homing agent is, today, imponderable to any except those at work on them. Whether we solve the problem of electronic beam refraction in the ionosphere is only a question.

The challenge, however, does not dismay those of Inyokern, for it was by just such efforts that the Naval Ordnance Test Station, the city within itself, earned the title: "Rocket Town, the Miracle City."



Official U. S. Coast Guard Photograph

FIRST THINGS MUST COME FIRST

If the initial enemy threat is by submarine, then anti-submarine measures must have priority; if the threat is by air, then interception and anti-aircraft defense should head the scale.

THE NATIONAL MILITARY ESTABLISHMENT AND DOLLARS

By CAPTAIN J. E. HAMILTON, *U. S. Navy*

AS THIS paper is being written, the government departments are working behind closed doors on the annual budget problem. It will not appear to the public until after the problem has broken out into the open with the President's Budget message to Congress.

The President disclosed a year ago that the defense establishment had requested 23 billion dollars for fiscal year 1950 and that he had set a ceiling of 14.4 billions as the maximum which they could request. In the spring of 1948 when the 1949 budget was being considered by Congress, the Senate Appropriations Committee reported that the 1950 cost of the program then being initiated would be in the order of 20 to 25 billions. Thus apparently the National Military Establishment contemplated that the expansion program, begun with the increase of airplane procurement in May-June, 1948, would be continued in 1950 in about the way that it had been planned.

It is a fact that since the prospective costs for 1950 were discussed there has been an increased cost in many elements which military appropriations pay for. Thus, even though the 14.4 billions ceiling is perhaps 7 per cent higher than the appropriation for 1949, it will buy just about the same amount.

What does a military appropriation pay for? It should first buy insurance. What is that insurance? It has two elements: first, protection against the possibility of war; and second, minimization of the cost of war if the first fails.

If military appropriations will buy a military establishment which patently is so effective that no antagonist will take a chance on war, they will have eliminated personal war casualties, economic displace-

The opinions or assertions in this article are the private ones of the writer, and are not to be construed as official or representing the views of the Navy Department or the naval service at large.

ment due to war, physical damage and destruction caused by enemy action, widespread social readjustments, and the straight out-of-pocket costs of war. Such savings cannot be evaluated in dollars, but it is safe to say that the cost of insurance to provide them would justify very heavy expenditures.

The converse, of course, in a country like the United States is that if the insurance cost is too high, the economic imbalance imposed will in turn result in some social costs similar to those of war. It must also be considered that no nation in history has yet been able enough to maintain a military establishment which prevented war.

The second purpose of the insurance accomplishes two things. It shortens the length of the war and it holds enemy attack as far away from ourselves as possible. As an example, consider the difference between the cost of World War II ending in September, 1945, and what it would have been had the end been delayed for two more years. Also to be considered is the difference in cost of civilian lives and property between what the United States actually suffered and what it would have suffered had it been subject to the war treatment accorded to every major non-American country. This saving is also beyond evaluation, but it is tremendous and would be worth a very large annual premium in the form of military appropriations.

Apparently the planners on the military side evaluated the cost of carrying the insur-

GRADUATING WITH his Naval Academy class of 1921 a year ahead of time, Captain Hamilton completed a postgraduate course in Petroleum Engineering, and in 1931 became identified with the Bureau of Engineering (now the Bureau of Ships). Selected for Engineering Duty Only in 1936, he has occupied administrative billets in the Bureau of Ships and in the field, and from 1946 to 1948 served as Deputy Director of Budget and Reports of the Navy Department.

ance during 1950 at 23 billion dollars. The Executive, with the necessity for considering the entire national budget and national economy has decreed that:

Either 62.6 per cent of the military estimate will provide adequate insurance;

Or the cost of paying insurance premiums in excess of 14.4 billions would result in increased taxes, economic difficulty, waste of natural resources and man-power, and other damage worse than the additional 8.6 billions would avert as cost of war.

This fiat will be much discussed, particularly in military circles. In the discussions will be a modicum of criticism. Such criticism is neither justified nor honest. The action of the President is a thing inherent in United States policy.

At no time, except during war or when war was practically inevitable, has the civilian side of the Federal Government not taken similar action. Prior to 1922 the action was normally taken by Congress when it acted on the budget estimates which were submitted by the Army and Navy. This action is well documented. Since 1922, the record has not been so clear.

When Congress found it necessary to place the responsibility for preparing the budget on the President, it adopted what has probably always been essential to any successful commercial concern. The organization of Congress itself does not lend itself to doing this task with the size of operations carried on by Federal Government since World War I. Congress always, however, has reserved to itself the right to evaluate the President's budget. It decides on what appropriations shall be made.

The Act which gave the President the budget responsibility was based on one assumption which seems reasonable; that is, that the Executive Branch will be well disciplined and will have the proper loyalty-up within it. Thus subordinates are not permitted to ask Congress for larger appropriations than the President has recommended. The result of this provision is that, for the most part, action within the Executive Branch is not well documented. In spite of that, I will venture to say that if the records were searched (including the memories of individuals concerned) it would be discovered

that a 37.4 per cent reduction between the estimates of the military departments and the President's budget was not out of line for most peacetime years since enactment of the Budget and Accounting Act in 1921. It will be found also that Congress has generally been satisfied with the action of the President, because the variation between appropriations and budget recommendations has been more in the order of 5 per cent.

Doesn't that historical fact carry any significance to the military mind? If it does, it does not become apparent from written and spoken words. Nor is it apparent from the historical fact that there was a Pearl Harbor.

Peculiarly, the annals of war are filled with cases of ordinary Americans in uniform making the best of what they had. Clever devices have been thrown together in the field to meet a particular situation. Equipment on hand has been used for far different purposes than its designers had intended. Men in the field tend to overcome material deficiencies by ingenuity and gallantry. Do we make as full use of those same attributes which we possess, in peace as we do in war?

How many are familiar with the annual budget struggle? Its pattern in peacetime is fairly constant. Basically nothing has been changed by the winning of World War II, by creation of the Department of Air, nor by Unification. It is cyclic between wars. One complete cycle began in 1919 and ended in 1941. The present one began in 1946. The phases of the cycle are as follows:

(A) National leaders, political, industrial and military, during the war make the statement: "We were unprepared for this war and the cost of that unpreparedness is very high. We must not, we cannot, we will not let it happen again."

(B) Immediately on the day of victory the cry arises from all quarters except the inarticulate military leaders: "Get our men and women back to normal peacetime tasks. Reduce military expenditures."

(C) A period of readjustment occurs during which our victorious military forces are in such a reduced state of effectiveness—nay, of efficiency—that they could not possibly undertake another campaign.

(D) A period of unsettlement follows

when the regular military forces gradually restore efficiency and evolve peacetime plans, but have been unable to agree with the civilian command as to what the size of the peacetime military force shall be.

(E) Decision is made by the civilian command as to the size (measured in dollars) of the military forces, with gradual reduction each year toward that Utopia of universal and everlasting peace wherein there will be no diversion of national effort to wasteful military expenditures.

(F) A minor spark flares up some place in the world which induces enough alarm to cause a reversal in the trend and a gradual increase in the size of the military establishment.

(G) A major spark throws enough fear into the citizenry to bring about a rapid increase in the growth of military forces.

(H) War comes, and with it another all-out effort.

The cycle could be more finely subdivided, but the eight phases listed are enough for my purposes.

The budget phases which accompany the above social phases can be typed also:

(A) Practically unlimited appropriations are made, with sharply increased expenditures, probably reaching a peak and leveling off. It is while these dollars are going out that everyone close enough can see *several* dollars being spent which would be unnecessary had *one* dollar been spent earlier.

(B) Once the fighting is over, existing appropriations are rescinded and future ones are greatly reduced, but the estimates on which they are based are very uncertain. Payrolls are reduced rapidly by the exodus of the wartime recruits. Expenditures remain fairly high because wartime bills still come in for payment.

(C) Further rescissions of old appropriations are made. Estimates are firmed up. Expenditures gradually decline. Military plans for peace are laid before Congress and approved usually at levels which fully satisfy the military.

(D) The military prepares annual budget estimates intended to support the military establishment *which has been authorized by law*. The military estimates are reduced by the civilian command to an amount sup-

portable by the national economy and acceptable to the civilians.

(E) Decision on the amount of the budget establishes the actual size of the military establishment. Each year during this phase the military will start with estimates which would close the gap between actual military forces and those authorized by law. Each year the resulting appropriation, when the value of the dollar is considered, will provide for a somewhat smaller force. Each year the increase recommended by the military will become a little less.

(F) With increased international tension, military estimates provide for much greater increases each year. Civilian action will bring about much smaller increases than those requested, but they will be increases.

(G) With the war threat becoming grave, civilian control will tend to accept military increases. In fact civilian lethargy may clear up faster than the military's, and increases may even be greater than requested by the military.

(H) Actual war again brings all-out increases, all-out estimates, all-out appropriations—increases at any cost, without time to exercise economy. Then we go back to "A" again.

Now today we are in phase "D." During the spring of 1948 it looked at one time as though phase "F" had already come. It seemed that all of the sparks around the world were sufficient to put the United States on the *qui vive* even though the state of quasi-peace was less than three years old. This point, the last time, was not reached until 1938, or 20 years after World War I. The recent action announced by the President in regard to the 1950 budget indicates that the alarm was false. We are still in phase "D."

This phase is the ideal one. It establishes what the cost of the National Military Establishment is going to be. It probably establishes that cost in dollars, with little consideration of what the dollar will buy. It provides a budget ceiling which can be expected to be less with each succeeding year. The reductions from year to year will not be great, but the trend will be definitely in the direction of reduced armaments.

I believe that that paints the inevitable

picture. I believe that the United States will thrive in spite of what the military prophet may predict. There is an old adage, "If you can't lick 'em, join 'em." It cannot apply to every situation, but, with reservations, it can apply to the budget problem of the United States National Military Establishment. It would be exemplified by a cooperative meeting of the minds between the military and the civilian elements. Such a situation where the lion and the lamb lie down together could show to the world a picture which could discourage any aggressive act leading to war. It might conceivably lead to perpetual peace because of the sheer potential strength of the United States.

What I have in mind is far from a surrender of principles by the military. Nor is it a one-sided proposition. I want the military to exhibit such a degree of leadership in military matters, as they relate to civilian matters, that they will draw civilian support wholeheartedly to them.

The problem could be very simple, theoretically. Perhaps it is most difficult because the military mind tends to be direct and decisive. It is more matter-of-fact than the civilian mind and also less willing to surrender a principle to expediency. An outsider might also charge that since the military man is human, he has his full share of pride and ambition. Pride leads to stubbornness, and ambition to self-aggrandizement. Pride also leads to clean personal living and clean thinking, and ambition leads to sacrifice.

Whether or not I am right in my feeling that civilian thinking attributes the first stated characteristics to the military, I am unquestionably right that the latter ones are those which regular military people claim to have. If we have the ideal attributes which we claim to have, we can handle the situation. If we are otherwise, the next Pearl Harbor will be a horror, and the regular military may expect to find itself completely discredited when the smoke clears, *if it ever does*.

There are probably several areas of conflict between military and civilian, but the most important one and the one which can lead to clearing up all of them, is the budget. If the military can establish a satisfactory

budget position, it can thoroughly establish itself in the United States against subversion of every kind.

This problem is easy to state. It will be found much more difficult to solve. Simply stated, it is to devise a National Military Establishment which at the beginning will cost less than 15 billion dollars a year and will tend to decline rather than to increase, but which will be adequate for providing the diplomats of the United States with an *apparently* strong right arm in peacetime and for striking immediately *and continuously thereafter* and with increasing strength if the peace is violated.

The solution requires complete submergence of individuality, both of person and of service, and intelligent and careful expenditure of every one of the 15 billion dollars.

This paper does not have to—in fact, cannot—solve the problem. It can point out ways in which the solution may be sought. An analysis of a military budget leads to the places where the answer lies.

The military budget, just like any other, may first be broken into two parts: The first part comprises the dollars which are paid directly to individuals on military departments' payrolls. These individuals can be classified in a great many different ways, but the following grouping will suffice for our purposes:

(a) Commissioned Officers on continuous active duty whether these be regular, reserve, or retired. Include students at service academies in this group.

(b) Enlisted personnel on continuous active duty whether these be regular, reserve, or retired.

(c) Classified civilians under civil service.

(d) Unclassified civilians.

(e) Retired and inactive personnel from any of the first four groups, although the retired pay of the civilian groups is not a charge to military expenditures.

(f) Part time personnel, which will include reservists, national guard, R.O.T.C. students, and some contract civilians.

The average cost of all of the individuals in the full time group will be in the order of \$3,000 per year. This represents only the direct payment part, which is practically



Official U. S. Coast Guard Photograph

WARTIME EMERGENCIES STIMULATE INGENUITY

In the Anzio fighting, this LST was made into an emergency aircraft carrier by means of a hurriedly improvised flight strip.

all of the cost for civilians, most of the cost for the commissioned officers, and only about two-thirds of the enlisted cost. The other costs which are actually included in the other part of the budget will average probably \$500 for each full-time person on the payroll.

The part-time personnel will cost a great deal less, but of course their services are not as adaptable to operating the peacetime establishment. The total direct cost for these should be not more than \$200 average per year. If their availability and useability in wartime are instantaneous and universal, respectively, then they constitute a cheap and yet real part of the peacetime establishment.

The other major division of the budget covers payments for things which are purchased from people and from firms not on military departments' payrolls. These purchases can be classified in many ways, but let's try this grouping:

(a) Food, clothing, railroad travel, medical supplies, and other similar things neces-

sary to provide obligated service to individuals on the direct payrolls.

(b) Tuition, textbooks, training devices, and other things which the government must buy for the training or education of its direct payroll personnel.

(c) Fuel, ammunition, and other consumables required for the direct payroll military personnel to operate the real property and military equipment which are the tools of the military establishment, such as ships, airplanes, tanks, and artillery.

(d) Materials to be used by direct payroll personnel for keeping the property in repair, *or* for contract payments to non-payroll organizations to make the repairs by furnishing both labor and material.

(e) Items to be added to existing equipment for its improvement and modernization, *or* contract payments to non-payroll organizations for making the improvements.

(f) New items of equipment to be added to the establishment or to replace equipment on hand, *or* materials for use by payroll personnel in manufacturing the new equipment.

(g) Material for payroll personnel to use in research and development to improve equipment, *or* contract payments to non-payroll organizations for purposes of research and development.

(h) Payments to non-payroll organizations for preparing plans for mobilization, *or* material and expenses for payroll personnel to carry on the planning.

My classification could be attacked or questioned but it can be sustained. Unfortunately for this type of classification, there is complete cross-costing. If military expenditures are set up in the following classification:

- Operation
- Training
- Maintenance
- Modernization
- Expansion
- Mobilization Readiness

which will cover the peacetime field, it is apparent that parts of each one are normally provided completely by payroll personnel using purchased materials, and other parts are completely purchased. That is perhaps the most important thing which confuses the budget. It is impossible to arrive at a cleancut objective classification. The splits of tasks, first between military and civilian payroll personnel, and second between payroll personnel using purchased material and contract purchases, are so variable and arbitrary that the clean classification which is the goal of budgeteers cannot be realized. That does not stop us from making a practicable and understandable classification of military expenditures. In fact, I hold that either of those just presented will suffice. I shall use the first with its two main categories and 14 sub-categories.

We must not lose sight of our goal, which is an establishment capable of exhibiting real strength at all times, ready to strike a retaliatory blow on an instant's notice and from that same instant begin to increase in power so that strikes will be continuous and of ever increasing intensity until the war is won.

The continual show of strength has two facets. One of them should present to the world a stable national economy, both gov-

ernmental and private, while the other simultaneously exhibits an alert and *overt* military organization. Twice, recently, a potential military power in the United States has been hidden enough to fool aggressors into taking a chance. Our failure to display that potential had much to do with wars coming to us.

What does it take for that immediate strike? What will the strike be against? What will bring on the need? When should we expect it? Those four questions are listed in the order in which their answers are more obscure.

The best thinking and theorizing cannot tell "when." Continuous good intelligence service, at the time, might give warning of more or less duration but that warning might not give time to try to work out the other answers. The only practicable answer is that it might be *tomorrow* or at any time thereafter. If "tomorrow" is possible, then the only answers which are safe for the other questions are ones based on today's knowledge. They are not answerable by what may be known *some* day.

As of tomorrow we can believe that an opening attack is possible in four areas. I can visualize no others. First is the "Wooden Horse of Troy." That method of attack, whatever weapons are used, is far more than a military matter and I will not consider it much further. Defence against it is an internal police matter, and military retaliation will be satisfactory only if a foreign source can be proved and only after internal sources of trouble have been rooted out. If we don't develop adequate police protection against such a method of attack, military force may never be brought into action and might be useless if it were. For that reason I will have to assume that we have protected ourselves adequately against subversion and sabotage.

With that dismissed as outside of our problem we have today three general vulnerable areas. One is the Continental United States and its few outside territories. The second is our far-flung channels of trade on which our full economy depends. The third is those foreign areas whose integrity is a part of our current policy. The methods of attack in these three areas are: long range

aircraft or mobile launching platforms for guided missiles for the first area; submarines or aircraft for the second; and armies for the third.

What is the chance that *today* any other country could launch *and sustain* long range aircraft attacks against us? The energy required for that would be tremendous. None, including ourselves (from territorial United States) could afford to launch such an assault as the *main* attack. It would most certainly be one of the side lines and would very probably hurt. What are the only present defenses against that? Interceptor aircraft or anti-aircraft guided missiles with radar warning might reduce the damage. They would not eliminate it. They could, after an attack, make it difficult for the attackers to get back home and thus would increase the attrition and make the method of attack most expensive.

How about guided missiles launched from mobile platforms? Let's leave surface ships out of it. Their construction is hard to hide and for the present we don't have anything to fear here. That leaves airplanes and submarines with not too much to choose between them technologically. Economically the submarine presents the better choice both for an initial attack and for sustaining it. The submarine could be used tomorrow. Could the airplane?

Now what might be the method of attack against our commerce to cut off the supply of many materials which are vital to our economy? Twice a war has been nearly won with submarines. That is known. Can you visualize the airplane coverage any possible enemy would have to have to cut off or even to cripple our commerce? Of course he could damage it, but which would be the *cheaper* way of doing equivalent damage?

Remember that since the peak of the last submarine campaign against us, *actual* development *and production* has made submarines relatively independent of the *surface* of the waters and has increased their underwater evasion area after an attack by from nine to sixteen times (the squares of 3 and 4 which is the order of increase of underwater speeds).

The integrity of our alien interests is, of course, open to attack by either internal

action (sabotage or subversion) and ground forces whether transported by air or by land. The first of these is, as in our own case, a matter of policing backed by the will to prevent it. Since I doubt if we could ever adopt a policy of enforcing military control over quasi-friendly alien country to prevent its compliant surrender to a possible enemy, I must omit this form of attack as being counterable by military action. In fact our non-military action to date has been sufficiently successful to justify itself.

If local police methods, buoyed up by our moral and physical (short of war) support, fail or if the friendly country is actually subjugated by military invasion, will the cause of our war have arrived? It hasn't yet as an *immediate* cause. Whether it will hereafter will depend on many things. If it does, then we will have the initiative in deciding on the initial counter-strike, and its continuation must be tailored to the existing conflict in the form it exists in at the moment of decision.

Twice our help has been needed in this order: first, military equipment; second, assistance in overcoming a submarine menace; and third, men. Of course, the anti-submarine assistance involved use of our men *and* our equipment, but in spite of the few cases where unmanned ships have been furnished, one gets to think of a ship and its crew as being one. In World War I, when we reached the non-naval stage of furnishing men, for the most part these troops used allies' equipment. In the second venture they had to take their own with them. In neither case were the men gotten into their theater of operation until the submarine was under enough control to assure safe passage for the men. If the need for furnishing men to assist allies arises again, will it be practicable to deliver them other than over a free ocean?

The last few paragraphs have been in the nature of "rambling around." I said that I could not solve the problem, nor do I intend to try. I have merely run through some of the reasoning that occurs to me in seeking for a solution. My reasoning cannot escape the charge that I am a naval officer and hence biased. Surely, however, military minds in the three services can do this job, and with subjection of self and service to

national interest can come out with a reasonable answer.

My argument is presented only as an example. Suppose that I am right, and that as of today the only attack which might be made to throttle us and which could be both initiated and *sustained* is by submarine. Isn't the proper answer then to an earlier question that our most immediate retaliatory force should be designed to try to reduce the inimical submarine force so that it cannot sustain its attack?

If a similar argument by military authorities who know *the facts* led to the conclusion that there did exist enough bombers with enough range, backed by enough fuel and bombs and replacement crews to make an ~~initial~~ attack and sustain it to the throttling point, wouldn't the answer be that our ready striking force should be designed to reduce the inimical air force so that it could not sustain its attack?

It seems to me that either the bomber or the submarine is the thing to fear. Ground forces in sufficient strength, landing *any place* on United States territory to actually subdue us, seems utterly fantastic unless first preceded by complete failure of police power and surrender to subversion.

Now the counter to either airplanes or submarines if sustained attack is to be eliminated is, in order of effectiveness:

(a) To destroy every unit on its way to attack and before it returns to base to operate again—preferably, of course, before it reaches its first target.

(b) To protect every target so that no attack is possible even though the attacking unit is not destroyed.

(c) To destroy operating bases or supply channels so that, even though still existing, the units are deprived of their means of operating.

(d) To destroy the source of replacement units.

(e) To destroy the source of materials for making replacement units.

If the order of our defensive attack were made in the reverse of the above listing, the enemy attack would continue just that much longer. The greater also would be the cost to us in damage caused by enemy action.

If a thorough and objective study along

the lines indicated is made, won't it prove to logical minds where the United States must be ready *first* to minimize the cost of enemy action? If it does, cannot those same minds evaluate the optimum solution which would result in the best military establishment at the least cost?

If the first defence attack is to be against submarines, then we should have a ready-to-go, modernly equipped anti-submarine force made up of fully manned, ready-for-action units of the types best suited for that work. If that should be the immediate decision, but developments of the next five years, say, indicated that the bomber had then become the number one threat, then a shift to the indicated form of defence should be made as soon as that is known.

The type of flexibility which I visualize poses a real problem of subjugation of personal aggrandizement to national service. This would be required equally of full time (Regular) and part time (Reserve) personnel. The peacetime goal would be the very least number of persons, in uniform or not, on full time payrolls and enough others on part time payrolls to provide for their activation at a rate sufficient to man equipment as it can be made ready or delivered ready for service. The flexibility could be provided by holding Regular military and civilian personnel at the barest minimum. The flexibility in military personnel would be in a flow of Reserves between continuous active and inactive service as necessary to build up those services or branches which at the moment must meet the first attack. Flexibility in civilian personnel would be obtained by performing the greatest possible portion of civilian type services by contract rather than by payroll personnel. Reductions or increases at any time in any area would then be absorbed by the entire civilian economy in that area.

In the other main part of the budget—things purchased—flexibility is also required. If we can afford a wartime force of *modern* anti-submarine units *and* a wartime force of *modern* anti-bomber units in peacetime, let us by all means have them both and keep them up to date even though it would mean that we, in effect, throw them away every five (for aircraft), fifteen (for submarines),



Official U. S. Navy Photograph

SAFETY OF THE SEA LANES WILL BE AN ABSOLUTE REQUISITE FOR SUCCESS

Torpedo bombers from a U. S. Navy escort carrier shepherding a convoy through submarine infested waters during World War II.

or twenty (for surface craft) years if periods of peace last that long.

If we can't afford those two things plus the nuclei of all of the other things we must maintain, then first things must come first. We must not fear peace any more than we can afford to fear war. We should fear the waste of peacetime obsolescence of military equipment which can be even more expensive *with little wartime utility* than excessive full time payrolls.

What we want at any moment is a full complement of the units which should go into play *first* if war comes, and then means to get all other units required as rapidly as possible if that is consistent with the rate at which the equipment can be manned.

On the material side, the big triumvirate are: Research and Development; Industrial Mobilization Planning; and Production. The first two are the peacetime methods of getting ready to win a war. The last is an essential to be brought into play without restraint just as soon as international conditions con-

vince the civilian command that the economic upset of war is inevitable. This may or may not be before an enemy has opened hostilities.

Research and Development are relatively cheap. There is a limit to the amount that sober and intelligent men can spend for these purposes. Research which is very inexpensive discloses hitherto unknown facts. Development which follows, and which costs much more, adds these new facts to the catalogue of knowledge on hand and brings forth tools. In this task, Development from time to time will fall back on Research to help it over blind spots. The team, working hand in hand, presents to the world—in our case to the National Military Establishment—a physical object which is actually available for test, operation, and evaluation as to its useability.

As soon as a newly developed tool comes into the hands of the military, it should be evaluated as rapidly as possible; tasks which it can perform better than any existing tool

must be decided upon; these tasks must be assigned to their proper strategic field; and estimates must be made of quantities required for various purposes.

If the tool is one which will contribute to that force which is preeminent at the moment, production of the full quantity required for that force should begin at once and be completed as soon as possible. If the tool is of such a nature that advance training is necessary, production of a limited number for training purposes should be undertaken. Preferably this limited production should be so scheduled as to contribute without additional cost to Industrial Mobilization Planning in the nature of educational orders. The order should be spread thin enough to give all of the industrial units which will be used for full out production of the gadget, the "feel" of its production.

If the new thing is one which would necessarily come into play at a later phase of a war, it should be set aside for later production.

As the strategic situation changes and decision based on facts is reached to shift the form or the nature of the opening counter-strike, the required action is quite simple. Inactivate equipment, and the reserves manning it, which is no longer to be used in the opening phase, and call up the proper reserves to man the new equipment needed as it becomes available from storage or from accelerated new production. This new production would mean removing the stops on the latest developed items in the categories required, and then applying *to these items only* all of the pressure which would be applied in war time. The timing of the shift is a very important feature which cannot be casually handled.

If the permanent military establishment has been well designed, these shifts will impinge on civilian life by requiring only selected categories of civilian reservists to give up, for a period, their civilian careers; and requiring only selected segments of industry to displace their civilian productions to make way for military orders.

The secret of obtaining rapid production in volume is, of course, Industrial Mobilization Planning. Properly conceived and properly executed, Industrial Mobilization Plan-

ning will permit production of any developed item to start in a matter of days instead of months, and peak required production to be reached in months instead of quarter-years. It costs money, but microscopically little where considered as a part of the grand total of 15 billions.

I have discussed the elements which go into the construction of a military budget estimate which can be sold to civilian command. In building it, the first requirement is sound decision based on reason and marked by subjection of self and service to the nation. The second requirement is a citizenry prepared to do its share through Reserve service or by doing without something even in peacetime. The third requirement is an industry willing to cooperate in Industrial Mobilization Planning, and willing, on occasion, to shift its production even in peacetime to meet changing military requirements. The fourth requirement is a civilian command willing to regulate the second and third requirements by enacting any necessary legislation and by meeting the military command halfway in arriving at appropriation figures.

The budget when it is finally worked out would provide:

(A) Everything required for Research and Development.

(B) Everything required for Industrial Mobilization Planning.

(C) Adequate educational orders as the bridge between the two foregoing.

(D) A minimum for regular military personnel in all services.

(E) Adequate active Reservists to increase operating forces in the areas and services where required for the first strike.

(F) As full training as possible of inactive Reservists for the services.

(G) A minimum of regular payroll civilians to perform work which could be done by contract.

(H) Everything needed for production only of the items needed to keep the initial striking force ultra-modern.

(I) Everything needed for operating supplies for the initial striking force plus a ready reserve of such supplies.

(J) Minimum operating supplies needed for training only of all other forces.

(K) Everything needed for administration to provide for adequate control of the entire establishment, including Planning.

If the theory contained in the above discussion could be fully attained in practice, and if the practice was publicized with pride, it could present a picture of such tremendous war potential that war might

never come unless we ourselves turned aggressors. If war did come, it would reduce the damage both by attacking the most dangerous threat first and pulling its teeth, and by bringing on a total effort so rapidly that victory would come early.

How closely can men of goodwill approach an ideal?



HE WAS NO SEA HORSE!

Contributed by CAPTAIN RALPH C. PARKER, U. S. Navy (Retired)

It was back in 1933 or thereabouts. The *U.S.S. Nitro* had arrived in San Diego from the East Coast, and a local paper commented in humorous vein about her star passenger—a horse, which had rebelled against sea-going life to the extent of refusing to sleep in a hammock. Far from being merely a reporter's hop-dream, this was literally true. The circumstances were as follows:

The *Nitro*, in addition to ferrying ammunition, carried many an odd item of cargo for other Government activities. Hence her skipper was interested rather than surprised when informed that the Bureau of Animal Husbandry wanted to ship by her, from Norfolk to Guam, a young stallion, destined to improve the breed of horses on that distant island.

In due course a crate containing the horse was delivered alongside, hoisted aboard, and secured on the main deck, where a young bluejacket of farming antecedents took over as groom and caretaker to the friendly but mettlesome animal. The crate had been built with narrow clearances to prevent its occupant being thrown in a seaway; and instructions from the Department of Agriculture had suggested that in addition a heavy band of canvas be run under the horse's belly and drawn taut, so as to take some of the weight and allow him to rest more comfortably.

It was fine weather a few days later, with the ship plowing southward thru Windward Passage, and general peace and calm prevailing. The Skipper, sunning himself on the port bridge wing, felt that it was almost robbery to draw pay for such pleasant and uneventful duty. He should have known better!

There came shouts from the deck below, a drumming of hooves on wood, and lo, there was the horse, stuck half in and half out of his crate, snorting, plunging and kicking. This is what had happened:

For ease in feeding and watering they had removed first one bar and then another from the front end of the crate, until the remaining barrier was less than five feet high—a proceeding which seemed safe enough with so tractable a creature. The trouble started when the First Lieutenant and the groom decided that the time had come to try out the belly-band, which in effect was a sort of hammock. It is uncertain whether the horse visualized having to "lash and carry," or was just ticklish in the tummy, but anyhow he did not like it a bit and so indicated by direct action. He jumped, but bumped his head on the low crate roof, and hence got over the bars with his front legs only. His hind legs remained inside and there he stuck, unable to go forward or backward, and now thoroughly scared and indignant.

What to do? You cannot force a horse backward over a fence; and if he emerged frontwards and got loose on deck, he might, in his nervousness, clear the ship's rail in one bound. The Skipper would then have a problem in "Man Overboard" seamanship which both *Knight* and *Luce* seem to have been discreet enough to duck.

Something had to be done, however. A number of strong halters, manned by husky seamen, were attached to various portions of the horse's anatomy. The bars underneath him were removed one by one; and as he shot out of the crate like a buzz-bomb, he was held by sheer weight of numbers to a mere prance or two, while his groom soothed him with sugar and fair words.

Neither by bribery or persuasion, however, could he be warped back into his narrow cage, either head on or stern first. The crate finally had to be taken apart and rebuilt around him. Needless to say the "hammock" under his belly was not insisted upon. If one belongs to the cavalry by instinct, it's no use forcing him to be a sailor!

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS.)



Official U. S. Navy Photograph

CHEATERS CHEATED—ONE OF THE *MOGAMIS* AT MIDWAY

Cunningly designed for 8-inch guns, the *Mogamis* were originally armed with 6-inch treaty-size guns, but were promptly converted into heavy gun cruisers just before the war.

THE *MOGAMIS*: CHEAT CRUISERS EXTRAORDINARY

By WARREN S. HOWARD

THE AVOWED naval policy of His Imperial Japanese Majesty's government "was, and is, to maintain a fleet small enough to defend the country against any naval force which could be directed to the western Pacific by any naval power in the world."¹ Accordingly, "after the Washington conference every effort was made to build up a powerful fleet of light ships to compensate for the deficiency in capital ships, of which Japan was limited to only 9 as against the 15 each of the United States and Britain."

Most among "auxiliary ships" were light cruisers, the nearest thing to battleships, unlimited as to numbers and total tonnage, though a limit of 10,000 tons was placed on each cruiser. Japan got into their category with a modest splash in 1922, with the other navies of the world, with the coming down of the six 8-inch gun *Kikabou* and *Kako*. Listed at 7,100 tons, we now know that they were 8,800-tonners, but fitted with bulges later they may easily have been of the lower figure. A pair of these small ships, the *Aoba* and *Mugasa*, were laid down in 1924 and entered service in 1927, a year after the *Kikabou*.

Examples of that Japanese splash ultimately reached the rest of the world's navies. Britain replied with five *Kent*s, each of which surpassed the *Aobas* with eight guns on a 10,000-ton hull, and a little with similar *Londons*. The United States commenced its *Pensacolas* and *Northampton*s, France its *Tourville*s, Italy its

¹ *Year Book*, by the Foreign Affairs Association, Kenyushka Press, 1934.

light "auxiliary ships" by the language of the '20's in that only tankers, repair ships, and the like, but kinds of fighting ships except battleships and so much emphasis was put on the battle line that nothing else was considered to be auxiliary to it.

Trentinos, and in time even Spain and Germany produced their "treaty cruisers." The shipyards of the world had exploded from the modest Japanese start into a din of heavy cruiser construction.

In all this the Japanese kept pace. The eight-gun European heavies were soon surpassed by four *Nachis*, which mounted ten 8-inchers at their commissionings in 1928-29. The *Nachis* were listed at 10,000 tons, this being all that they could legally be; actually they displaced 12,700 tons. Next, begun in 1928, came the four *Atagos*, similar in size, armament, and general appearance to the *Nachis*.

While the *Atagos* were still on the ways, a second naval limitation conference was held at London in 1930. An important goal of the conference was the limitation of the heavy cruisers which were multiplying rapidly from Japan's two-ship start.

The 5:3 ratio went overboard in this conference. Japan gained a 10:7 ratio in heavy cruisers until the end of 1935 and was allotted 12 ships aggregating 108,400 tons; the United States was given 18 heavy cruisers of 180,000 tons, with the understanding that no more than 15 would be built before 1936. The Nipponese also obtained a permanent 10:7 ratio in light cruisers, with 100,450 tons in any number of ships. As for the heavy cruisers, the *Aobas*, *Nachis*, and *Atagos* would fill Japan's allotment and there could

BEGINNING PROFESSIONAL writing when a senior in high school, Mr. Howard displayed extraordinary maturity of judgment and acuteness of historical perception in his first PROCEEDINGS article, *The Kongos in World War II*. Now a student at the University of California at Los Angeles, he contributes an interesting account of Japanese subterfuge and its results on worldwide naval construction.

be no more of these laid down by her. The *Atagos*, completed well after the conference, were conveniently listed at 9,850 tons, thus making Japan's 12 CA's exactly total 108,400 tons (on paper); they were really 12,200 tonners.

Despite the raising of the cruiser ratio from 5:3 to 10:7, the Japanese were far from satisfied.

The Naval Treaty signed in London in 1930, however, again gave Japan a low ratio in the number and tonnage of 8-inch-gun cruisers, and allowed her only 52,700 tons of submarines in spite of her demand for a minimum of 78,000 tons [yet this was parity with the U. S. and Great Britain]. This made it necessary further to reinforce the auxiliary fleet.³

As far as re-inforcing the cruiser portion of the "auxiliary fleet," much thought was required. Japan wanted heavy cruisers badly, and was devising tactics which would enable them to fight a war not as "auxiliaries" to the battle fleet but on their own; yet she was not allowed to build any more and had no tonnage left to do it in. She did have some light cruiser tonnage left, but had no great desire to build more of the sort of light cruiser that she had been building, for these were nothing but glorified destroyer leaders.

The fusion of excess light cruiser tonnage and a desire to close the gap between U.S. and Japanese heavy cruiser strengths produced one of the strangest attempts to get around treaty provisions ever brought to fruition. The Japanese took a basic heavy cruiser design, similar to that of the *Nachis* and *Atagos*, and built their new light cruisers like heavy cruisers, except for one change: the five twin 8-inch turrets of the heavy cruiser were replaced by five triple 6.1-inch mounts. The First Fleet Replenishment Plan of 1931 appropriated 103,200,000 yen for four of these cruisers, which were listed at 8,500 tons probably to conserve the slim tonnage that Japan had left in the light cruiser category. And in 1931 *Mogami* and *Mikuma*, cheat cruisers extraordinary, were laid down.

The word was passed along as to what sort of ships the new Japanese cruisers were to be. Considerable consternation must have been raised abroad, for there was nothing afloat among light cruisers to match them. The best U.S. light cruisers, distinctly old-fashioned in design, carried but ten guns against the Japanese ships' fifteen, and of those ten guns only seven could fire broadside. In Europe light cruiser design was much more advanced; yet even there the current CL's carried only eight or nine 6-inch guns. A new force was abroad upon the seas of the world; it was the large light cruiser with its massive 6-inch battery.

The United States and Great Britain hastily began work to meet the new Japanese cruisers. For our part, the 15-gun *Brooklyns* went from the drawing boards to the shipyards in 1935, the first four with NIRA funds. England, not to be outdone by either U.S. or Japanese efforts, got three *Newcastles* down in 1934, and three the next year. They were not clear matches, for they carried but twelve 6-inch guns in four triple turrets; and England has yet to produce a cruiser equal to *Mogami* and her sisters.

All this effort could not at once overhaul the Japanese start of three years. On March 14, 1934, the *Mogami* clove the water for the first time. Some ten weeks later the *Mikuma* was launched, and in the summer of 1935 the two cruisers joined the fleet. It was not until 1937 that the U. S. Navy's *Brooklyns* and the British *Newcastles* began appearing. On October 31, 1937 the *Mogami*'s sisters *Kumano* and *Suzuya* also were commissioned; although provided under the 1931 program, they had been laid down much later than the *Mogami* and *Mikuma*.

In 1933 the Japanese Second Naval Replenishment Plan authorized yet two more "8,500-ton" light cruisers. They ultimately appeared as the *Tone* and the *Chikuma*; and it was rumored that the big main battery on the *Mogami* had not worked out so well, for the *Tones* were supposed to carry but twelve 6-inch guns. Actually, they received their lighter armament because their entire after portion was given over to elaborate seaplane facilities. All four turrets were forward. They joined the fleet in late 1938 and early 1939.

³ *Japan Year Book*, p. 235-6, 1934 ed.

By 1939 we and the British had overcome the Japanese head start in large light cruiser construction by two to one. The *Newcastles* and *Brooklyns* each were equal numerically to the *Mogamis* and *Tones* combined, and future construction of a prodigious number of U. S. *Cleavelands* and of the British *Fijis* would swamp any further Japanese efforts. But here Nippon bowed out, to leave Great Britain and the United States building large light cruisers against each other.

For during 1938-39, as Japan began girding for war with the West, the four *Mogamis* quietly slipped into Japanese shipyards. There the triple 6-inch turrets that had adorned the heavy cruiser hulls were hoisted off, and in their places went the 8-inch turrets that by nature went with those hulls. It had taken a few years of waiting, but Japan now had parity in heavy cruisers, for the *Tones* also appeared with 8-inch turrets, probably from the start. The masquerade was over,

and Japan's revolutionary new light cruisers could now fulfill what they had been designed for: the duties of heavy cruisers.

And that is the story of the cheat cruisers. They fought through World War II in the Seventh and Eight Cruiser Squadrons as respectable heavy cruisers; while overweight by 2,000 tons (*Tone*) or 3,000 tons (*Mogami*), they cannot be singled out as especially dishonest in that respect, since the *Nachis* and *Atagos*, the German *Hippers*, and probably many other "10,000-ton" treaty cruisers were similarly overweight. The *Mogamis* and *Tones* served widely and with some distinction; but they achieved nothing great as did the *Aobas*, and left but a scant impression upon the war. Their impression upon naval history is nevertheless great; for the cruisers built to imitate them could not be rearmed with heavier guns, and thus every *Brooklyn* and *Cleveland* is a reminder of their ruse, and every large light cruiser must look to them as its ancestors.



DURATION

Contributed by MR. HARRY C. TAYLOR

In 1943, while awaiting reassignment at Norfolk, I was assigned to help outfit recruits pouring into the station. Scuttlebutt about training and what happened after the completion of training was offered by veterans of three weeks or less, and they were always asking us questions. One day, a young fellow stopped me and asked if I would answer a question for him. I assured him I would try, and he asked, "Will I have to stay in the Navy until all these clothes are worn out?"

HOLD EVERYTHING!

Contributed by MR. RAY FREEDMAN

It happened in North Africa. The GI strolled into the sick bay. "What's the trouble?" asked the medical corps major with an apathetic air.

"I got a sliver in my foot," complained the GI with a wry face.

"Go into the next room and take off your clothes," said the medic.

"Take off my clothes?" protested the GI. "But I . . ."

"Do as you're told, soldier," ordered a Wac nurse.

The GI did as he was told, muttering under his breath. There was another man in the room also stripped to the nude. "Imagine," complained the GI, "I get a sliver in my foot and the doc tells me to undress."

"What are you squawking about, soldier?" sneered the other fellow. "I came in here to deliver a package—and look at me!"

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS.)



Official U. S. Navy Photograph

IN THE LAND OF SUMMER WARMTH AND SUB-ZERO WINTER COLD

U. S. Seabees dredging a water supply system on the island of Attu. A few feet below the surface there may be permafrost as hard as concrete.

NAVY COLD WEATHER CONSTRUCTION ENGINEERING

By GEORGE W. GRUPP

FOR ABOUT one hundred years, and especially during the past decade, the Navy has been aiding the steadily increasing number of human beings of the temperate zone who are endeavoring to inhabit, to work in, and to survive in those regions of the world where it is common to find sub-zero temperatures.

At first, like innocent children, the pioneers failed to recognize to the full that nature does not respond the same way in all parts of the globe, not even in two different sections of the Polar Regions.

In the cold weather regions nature must be judged with an alert constant difference for she delights in trapping the unwary, and in making fun of the ignorant. When men walk across the frozen spaces in sub-zero temperatures she teases them by turning off the lights of their new flashlights; and she laughs at them by making their watches stop or slow down. If workmen place hand tools on the snow, and if they do not constantly keep their eyes on them during a wind velocity of 16 miles per hour, then nature will cause the tools to disappear within 15 minutes.

Nature mystifies men by making their new steel ax blades brittle, and by making their new wooden handles snap off in minus zero temperatures. Men have been amused by her creation of landscapes with irregularly inclined trees, called the "drunken forests" of the north. The patience of men of the cold weather regions is tested when nature deforms the framework of their buildings, and causes their supports to collapse. In her playful moments nature startles the north country men by making a railroad road-bed look like the hills and valleys of an amusement park roller coaster route.

When men saw nature do these and other unconventional things in the cold weather regions they first tried to fight her by using stronger materials, by designing more rigid

structures, and by making costly periodic repairs, for it must be remembered that frozen ground can develop upward thrusts in excess of 28,000 pounds per square inch—14 short tons per square inch.

Rather than continue their losing fight with nature, men decided to understand her, to humor her, to work with her, and to adapt their usual temperate zone engineering methods and practices to conform with her laws of the cold weather regions.

It is only through the exercising of such common sense that men have been able to get along with nature in the Polar Regions. In other words, when men plan, design, work, and build in accordance with her cold weather laws she smiles on them and lets them survive, even though she cannot always restrain herself from annoying men for the purpose of letting them know that she is still the big boss.

Permafrost, which is one of the weapons nature uses to puzzle and worry Navy and other construction engineers, is neither a chemical nor a drug. Permafrost is merely a term meaning permanently frozen ground.

Permafrost is as hard as concrete. And yet, it is only frozen cold weather swamp land—land whose soil is referred to as bog, muskeg, or tundra. This permanently frozen ground penetrates from the earth's surface to depths ranging from a few feet to more than 700 feet.

Permafrost extends across northern Asiatic and European Russia, Alaska, northern Canada, Greenland, and the Antarctic region. In other words, about one fifth of the earth's land area is covered with permafrost.

THIS is the third and last of a series on man's problems in combatting nature in the Frozen North. The author, Mr. Grupp, was a professor at Webb Institute of Naval Architecture from 1922 to 1936, and is now Washington representative of a number of publications.

Whenever permafrost is present it usually consists of a number of different soil layers of variable thicknesses. Each of these layers must be studied carefully because a complete understanding and knowledge of their physical and mechanical properties are essential for sound cold weather construction engineering practice.

The bottom permafrost layer is inactive permanently frozen ground—ground which never thaws. This permanently frozen layer

the temperate zone. Its thickness depends upon the kind of soil and the insulating properties of the surface vegetation.

In both the temporarily and permanently frozen layers of permafrost one finds solid masses of ice. These sheet-like "ice lenses" or "ice veins," or large wedge shaped "permafrost islands" sometimes called "kidneys," are ground cracks, or fissures, filled with ice.

One might ask, how do the engineers of the

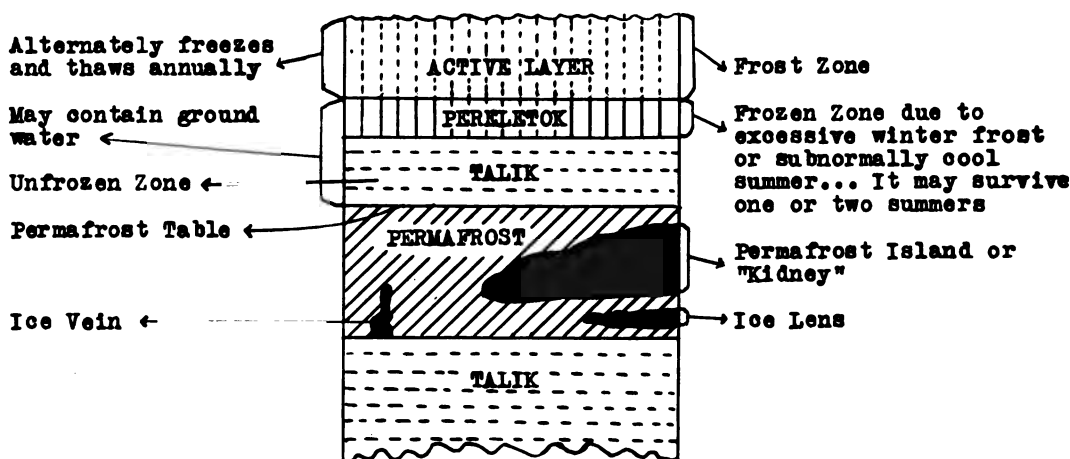


CHART 1. Diagram showing, without regard to thickness, the different layers in the permafrost areas.

rests on rock or on a layer of unfrozen ground called "talik," a Russian term meaning a layer of unfrozen or thawed ground.

Sometimes there is a layer of talik between the permanently frozen ground layer and the top layer called "the active surface layer."

A talik layer, unfrozen ground, may also be found between the permanently frozen ground layer and a short lived layer of frozen ground called "pereletok," a Russian word meaning "that which survives over the summer." This pereletok layer is that portion of the active surface layer which did not thaw because of an abnormally cool summer or because of an excessive previous winter frost. This pereletok layer has only a life of one or two summers.

The top layer, the active surface layer, which annually thaws and freezes, is comparable to the seasonally frozen ground of

Bureau of Yards and Docks ascertain the presence of permafrost in a given area? The answer is that nature has provided them with a number of natural surface indicators of the presence or absence of permafrost. For example, willow groves usually indicate the absence of permafrost and the presence of ground water. Generally speaking, fir trees only grow where permafrost is either completely absent or at a considerable depth below the earth's surface.

The presence of permafrost is always indicated by a ground surface which looks like a pattern of polygons, by the presence of cotton grass, by trees with curved trunks growing on soil slopes, by thick moss or hummocky tundra, by larch and spruce trees, and by dwarfed and stunted birch trees.

Permafrost is also indicated by "drunken forests"—trees which lean in all sorts of directions. These "drunken forests" are due to

and swelling—an expansion of soil when moisture content freezes to ice. Sometimes these are due to a combination of factors such as ground swelling and a rupture of the surface when the hydrostatic pressure of the ground water exceeds the elastic strength of the overlying active surface layer.

The hydrostatic pressure is caused by the expansion of the active surface layer as it settles down on the ground water which rests on the permafrost table, the upper

boundary of the natural drainage lines of the area, the topography of the area, the kinds of rocks, soils, trees, and vegetation, and the location of permafrost areas.

Next a ground reconnaissance study is made of the proposed site by a surveying party, a soil technician, a meteorologist, a geologist, and a construction engineer.

The construction engineer and geologist set out with six main objectives: (1) to determine the possible danger of floods from

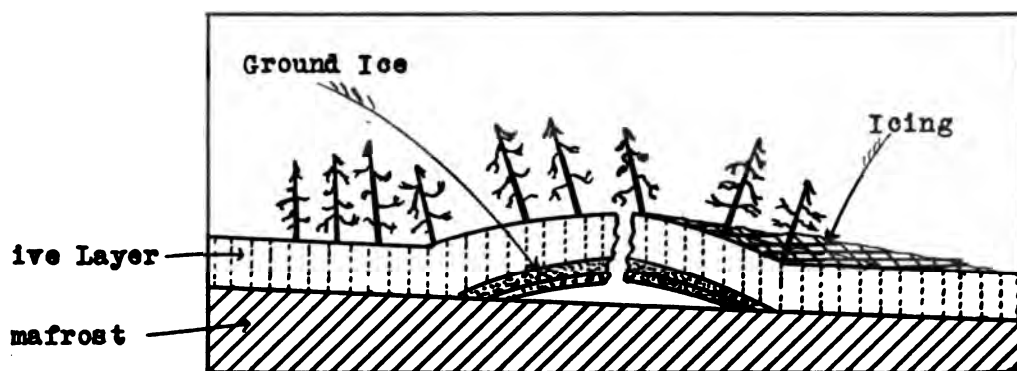


CHART 2. Drunken forest and icing created by hydrostatic pressure.

boundary of the permanently frozen ground. Naturally the ground water seeks to relieve itself of the pressure created by ground swelling during the freezing cycle of the active surface layer. When it finds a weak point in this layer the water pushes its way downward until the surface layer bursts at that point with a loud noise.

After this eruption takes place, the trees settle on irregular angles of inclination, and fields are flooded with water which soon freezes to ice. Should this rupture take place under a building, the structure will be seriously damaged or destroyed by the heaving ground and by the flowing water which freezes to ice after penetrating the building. Naturally, the first step in Polar Region building construction is to make an aerial reconnaissance (a) of the possible building sites within a given area, and (b) of the probable location of permanent, and construction, routes to each site.

The study of the aerial reconnaissance topographs of the area reveals such necessary construction information as the con-

figuration of the natural drainage lines of the area, the topography of the area, the kinds of rocks, soils, trees, and vegetation, and the location of permafrost areas. (2) to collect data on the location and available supply of water for drinking and other purposes; (3) to learn something about the site's ground temperatures at different depths; (4) to locate the upper boundary line of the permanently frozen ground called the permafrost table; (5) to ascertain details on taliks, pereletoks, and ice veins in the ground of the proposed building site; and (6) to calculate the thickness of the permafrost active surface layer.

While the geologist and construction engineer are collecting and studying their data, the soil technician makes a study of the depth, moisture content, and composition of each kind of soil of the proposed building site. At the same time the meteorologist keeps himself busy compiling and studying data on the directions and velocities of the winds, and on the amount of fog, precipitation, cloudiness, and daylight in the building site's area. Before these scientists have completed their studies, surveyors have established building site and other lines.

These surveyors, when working in high latitudes, are confronted with many difficulties. When Coast and Geodetic Survey and Geological Survey control lines are not available, then they must establish their own control lines. In such cases the vertical control lines are established with precise aneroid barometers, and the horizontal control lines are established by making observations of the sun.

If control line surveys are undertaken during the summer months they must be made during the darkest portion of the night, with

to periodically warm them up, the transit-men, note-keepers, and others would soon be useless.

High cold weather winds, especially in the Aleutian Islands where they are often accompanied by horizontal rains and snows, require engineers with great patience and skill to make accurate surveys.

Accurate surveying is difficult under working conditions where the temperature ranges from minus 45 or more degrees Fahrenheit in the winter to plus 90 degrees Fahrenheit in the summer. The winter low tem-

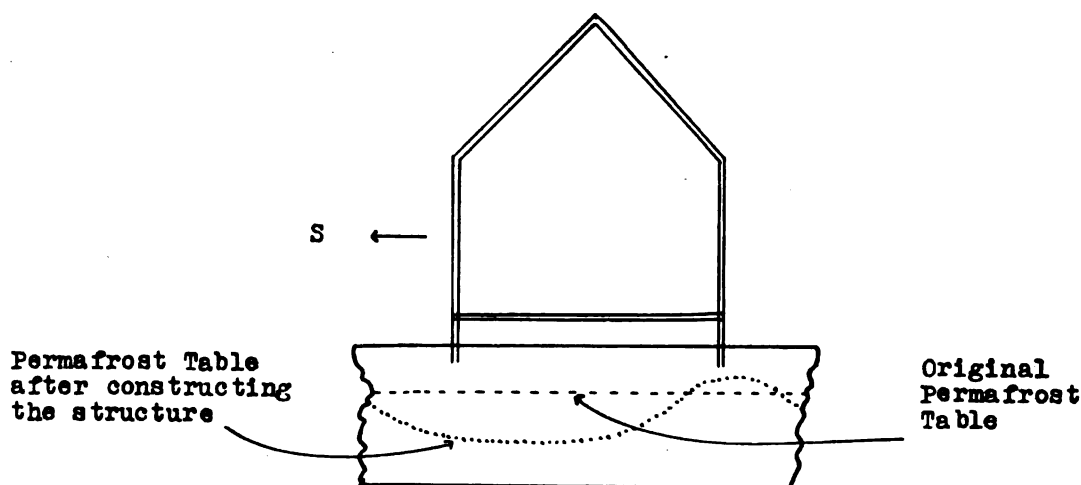


CHART 3. The effect of heat from an inadequately insulated structure on permafrost.

perhaps the aid of artificial lights, because the daytime heat waves are so intense in high latitudes that they cause serious surveying errors. And in addition to that, in some places during the summer months these surveyors have a hard time finding stable instrument sites because of the softness of the thawed permafrost active surface layer.

In the winter months the surveyors have a tough time maintaining permanent surveying reference points because of snow falls or snow drifts.

It is a test of physical endurance for a surveying party to work in temperatures below minus 20 degrees Fahrenheit. In such low temperatures the surveying party must be provided with mobile skid shacks equipped with heating facilities. Without these shacks

temperatures affect both the precision instruments and the surveyors. And the summer high temperatures, with their accompanying clouds of small flies and mosquitoes which attack men and becloud transit and leveling instruments, are obstacles which must be reckoned with if surveying errors are to be avoided.

In the selection of sites for hangars, living quarters, and other buildings, and in the choice of routes for roads and railroads, permafrost locations should be avoided. Unfortunately, this is rarely possible in the cold weather regions.

A building will suffer less damage from the upward thrust force of ground swelling when it is located on a site with gravel and coarse sand than one constructed on a site with sandy clay soil. This is due to the



Official U. S. Navy Photograph

FAR-NORTH SURVEYORS HAVE THEIR TROUBLES

Low winter temperatures affect both instruments and men; in the summer the mosquitoes and flies swarm in clouds.

greater moisture content of sandy clay soil. As a result, when sandy clay soil is in the process of freezing, its greater ground swelling capacity makes it potentially more destructive to a structure. Of course, ground swelling is less destructive to buildings when this expansion is uniform than when it is irregular.

Equally destructive to structures is irregular thawing of the active surface layer.

Naturally the sun's rays are more effective thawing agents on the south side of a building than on its east and west sides. On the north side of the building solar radiation has no effect as a thawing agent except as it is reflected from the south walls of adjoining structures.

If a heated building lacks two feet of air

space between the ground and the underside of the floor, and if the floor is not insulated with rock wool, moss, or some other insulating material, then the room heat may penetrate into the ground below the normal plane of the permafrost table of the permanently frozen ground.

For example, if the permafrost table is reasonably level on a particular site before the construction of a building, it will not remain so if the newly constructed building has not been provided with at least two feet of air space and insulated floor. The original permafrost table will dip from the north side of the structure (see Chart Number 3), to the south side. Naturally, this will have a serious effect on the stability of this building. With the coming of the first summer,

the building will be deformed, and it will be impossible to open entrance doors located on its south, east, and west sides.

Good cold weather construction engineering practice does not overlook the effects of ground swelling on foundations. A strong one-direction horizontal pressure from ground swelling can destroy a vertical continuous-wall foundation.

Experience has demonstrated that if vertical wall foundations are to be built, then it is better to use reinforced concrete or wood rather than masonry or brick. And since

Those parts of the piles which are embedded in the permanently frozen ground are roughened to increase their adfreezing property—the ability to bond with the permanently frozen ground in the freezing process. But those parts of the piles which come in contact with the active surface layer are first made smooth; then they are coated with heavy grease mixed with perhaps 5 to 10 per cent of graphite; and finally they are covered with tar or roofing paper. All of this is done to prevent, or control, heaving by the active surface layer during the freezing cycle.

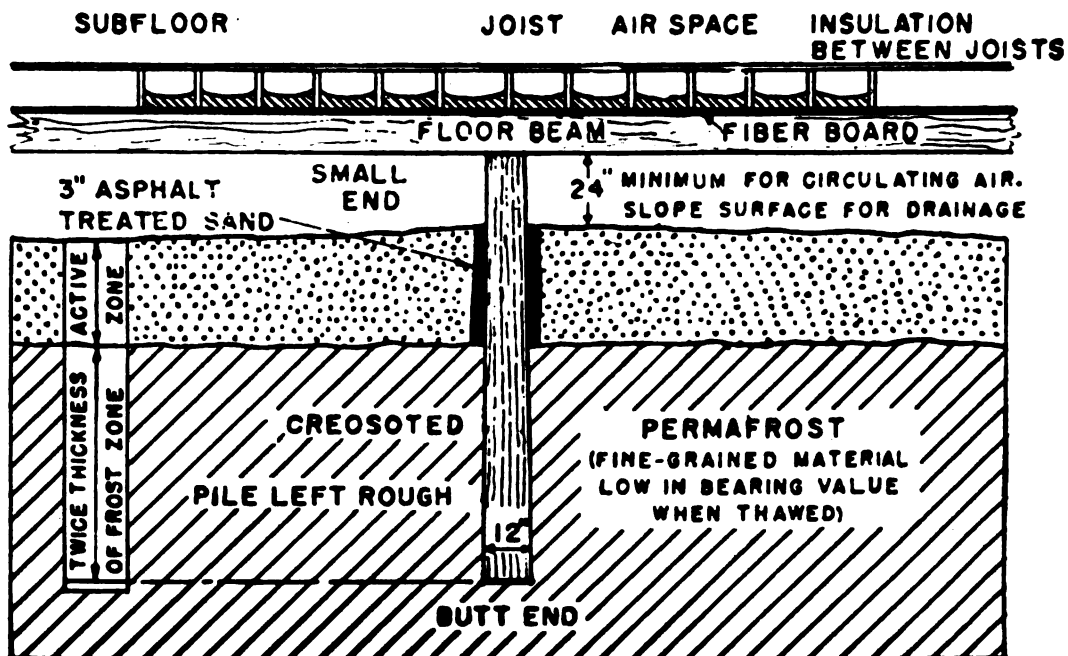


CHART 4. Floor and wood pile foundation construction in cold weather regions.

vertical wall foundations have the disadvantage of high thermal conductivity (the ability to transmit heat), because of their great contact with the ground, therefore it is better to construct foundations of piles, columns, or truncated pyramid piers with the smallest possible cross-section size.

Foundation piles should be driven into the permanently frozen ground layer, (see Chart No. 4), to a depth of at least twice the thickness of the top active surface layer. In some cases piles have been driven through a 3-foot active surface layer and then anchored in 13 feet of permanently frozen ground.

In the construction of foundation piers it is necessary to excavate temporarily and permanently frozen ground. Steam or electricity may be used for the thawing operation.

The active surface layer can be broken up with rooters, scrapers, graders, and power shovels, but the ground should first be carefully examined to prevent excessive damage to mechanical equipment due to its coming in contact with the high spots of the permafrost table.

The permanently frozen layer can be broken up by the use of pneumatic pavement

breakers, by blasting, and by thawing.

When concrete foundations are in the process of construction, the bottoms and walls of the pits in the permafrost permanently frozen ground layer are kept in a frozen state by a refrigerating system of pipes with circulating brine.

Before concrete foundations are con-

tion in high wind pressure areas, buildings are secured with cables anchored to deadmen piles or to heavy stakes.

Buildings without eaves can be more satisfactorily sealed against low temperatures; and their roofs are less apt to be blown off by high winds. The amount of wind pressure against buildings, and the cooling effects of

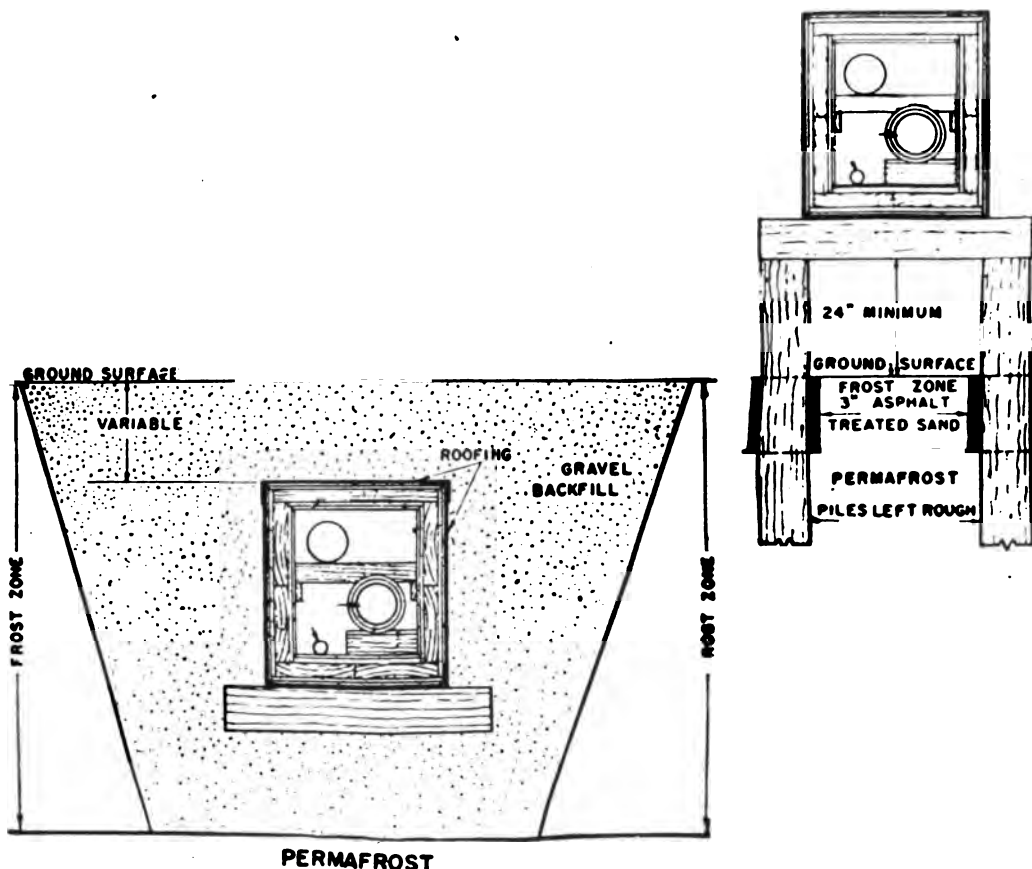


CHART 5. Cross sections of underground and elevated "utilidor" construction methods in sub-zero climates.

structed, the bottoms of the pits are first blanketed with three layers of insulating material to prevent the permanently frozen ground base from thawing. First, there is a 12-inch dry sand layer. Next there is a 4-inch dry foam glass, or rock wool, or tundra layer. And last, there is a 6-inch dry sand layer.

Superstructure walls are anchored to their foundations with bolts, cleats, or reinforced concrete to stabilize them against the force of high winds. As an added safety precau-

tion, the wind, are reduced when their lengths parallel the prevailing winds.

The roofs of cold weather buildings must not only be able to withstand the destructive effects of high winds, but they must also be able to bear up under heavy snow loads.

The most satisfactory roof covering in cold weather regions is the built-up type. The base of this type of roof covering consists of 30 to 90 pound bituminous saturated felt nailed to the roof frame. This is then covered with one or two layers of 15-pound bitumi-



Official U. S. Navy Photograph

TO PROVIDE SUMMER WARMTH IN 65-BELOW ZERO WEATHER

A post-war development, this prefabricated arctic barrack is designed to withstand 150 mile-an-hour gales and a 13-foot snowfall on its roof. Note that floor is raised and ventilated to minimize likelihood of ground swelling.

nous saturated felt which is mopped onto the base felt with hot asphalt, or it is held in place by nailed wooden strips.

All living quarters must have metallic, plastic, plywood, or wooden inner shells to exclude the cold, rain, snow, and wind.

In cold weather regions nature is adverse to non-essentials and to some of the modern facilities of the temperate zone. This explains why central heating systems are less common than space heaters.

The "two-hole" system is more frequently seen than the flush toilet system because sub-zero temperatures are destructive to modern sewerage disposal and water supply systems.

However, in a number of places where a sufficient number of human beings are in residence, utilidors have been installed at considerable expense. These utilidors are steam heated, tunnel shaped, heavily insulated structures which house filtered water, raw water and sewerage pipes, and telephonic and electric power cables.

A few utilidor systems have been built with spacious interior inspection and maintenance corridors for workers. Most of the constructed utilidors are smaller and more simple in design. These smaller utilidors are

comparable to the cross-sectional view of two types as shown in Chart Number 5.

Utilidors are made of wood, of reinforced concrete, or of a combination of these and other materials. All utilidors are insulated with moss, celotex, or some other insulating material to prevent the escape of heat from their interiors and to control cold penetration.

The sub-zero temperatures require that even the properly drained roads and runways must be underlaid with thick layers of insulating material to prevent their destruction by such permafrost elements as frost heaving—an up-warp due to the swelling of frozen ground.

The roadbed of a railroad line is usually built on corduroy underlaid with a thick layer of moss. This form of insulation controls nature from making the roadbed look as if it was built on a series of waves.

Sub-zero temperatures reduce the efficiency of structures, construction materials, construction equipment, and personnel in the open fields. As a result only emergency work, work necessary for survival, and heavy overland freighting of construction materials and equipment are performed in temperatures

below minus 25 degrees Fahrenheit.

If we assume that construction work can progress at the rate of 100 per cent during the summer months, then the rate of progress in autumn is 75 per cent, in spring it is 30 per cent, and in winter it is 10 per cent.

From all of this it must be obvious that when standard temperate zone construction methods and specifications are not modified, and when the elements of permafrost are overlooked, then nature rewards men with all sorts of unpredictable, destructive shenanigans. Foundation piles are thrust upward,

buildings are deformed, damaged, or filled with ice.

During the past decade the scientists and engineers of the Bureau of Yards and Docks, and others, have learned a great deal about how to retard or control the destructive efforts of nature. Their findings have taught men the value of cooperating with nature. And when men yield to the authority of nature, she permits them to live and work with comfort and safety in the development of the rich resources of the frigid areas of the earth.



A TOAST TO THE KING

Contributed by MR. PHILIP COLLINS

The North Sea was unusually choppy that evening in May, 1660, and Admiral Montague, commanding the British man o' war *Naseby* bound for Dover under full sail, was worried. With him in the ship's wardroom was Charles II, proclaimed the new King of England only a few days before, and Charles was celebrating. He had been in exile for ten long years. The wine and whiskey flowed effusively and the oaken ship's timbers echoed to the roars of Charles' laughter as he participated in round after round of drinks and stories with the ship's officers.

"Stop worrying, Admiral," laughed Charles, noticing Montague. "This is a wonderful voyage. And as the first official act of my reign I shall rename this fine ship of yours."

Just then one of the captains arose. "Gentlemen," he announced unsteadily, "I propose a toast to the king."

As the group of men seated about the table arose, Charles, somewhat askew from the liquid refreshment he had been absorbing, slowly began to raise himself out of his chair. Suddenly, with no warning, the *Naseby* dipped sharply in the heavy swells. The king lost his balance. His head struck the oak cross-beam with a sickening thud. He fell back into his chair!

"Your majesty! Are you all right?" choked out Montague, his face livid with fright. "Your head . . ."

For a moment, Charles, holding his head in his hands, rocked back and forth, grimacing in pain. Then slowly raising his eyes, he replied, "Of course, Montague. It will take more than a bump on the head to dethrone this King of England! Let us continue with the toast, gentlemen," and then he added slyly, "but let us remain seated."

The officers looked at each other. They were embarrassed and they were awed. To toast the king while sitting down, why . . . it was sacrilege! It had never been done before and moreover, in the presence of his majesty himself, it was an insult! They hesitated.

"Come, come, gentlemen. The toast!" prompted Charles.

From the opposite end of the table droned a voice, quietly, in hushed tones. "To the good health of our beloved monarch, His Majesty Charles the second; by the Grace of God, King of England, Scotland, Ireland . . ."

And the toast was silently drunk by the group of solemn men, each sitting stiffly in his chair.

Charles arrived in England two days later and was crowned king. But before leaving the *Naseby* he renamed it the *Royal Charles*, fitting in lieu of the fact that he had christened it, literally, with his own head.

But the incident that evening was not forgotten. For to this day, British naval officers when toasting the health of the King of England have the privilege of remaining seated; the only group of men in the world who can do so. And no doubt they offer a secret toast in their hearts to King Charles II, whose simple solution to an unpleasant incident provided this logical custom in a sometimes illogical world.

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS.)



Official U. S. Navy Photograph

EARLY NAVAL AIR BASES—PRE-WORLD WAR I

(Top) Group of U. S. Naval aviators at Pensacola in 1915, along with a biplane of the era.
 (Bottom) U. S. Naval aviation camp at Vera Cruz, Mexico, in April, 1914, the first time U. S. Navy flyers participated in actual hostile operations.

U. S. NAVAL AIR BASES FROM 1914 TO 1939

By DR. IVOR D. SPENCER

THE STORY of United States naval air bases in the years from 1914-1939¹ offers an interesting case study in national defense problems. The long and little known period from the start of World War I to the outbreak of World War II offers an illustration of that typical American unpreparedness in peacetime which has so commonly been preceded and followed by extraordinary bursts of energy in wartime. In the period of quasi-peace after 1945, however, the extreme American disarmament of the nineteen-twenties has not as yet been duplicated. Yet the earlier pattern is still worth observation.

Some months before the assassination of Archduke Franz Ferdinand brought a trigger-happy Europe to the armageddon of the first world war, the United States Navy had set up its first permanent air base at Pensacola. A trial beginning, it is true, had been made in 1911 at Greenbury Point, near the Naval Academy at Annapolis. The first naval aviator, Lieutenant Theodore G. Ellyson, had been trained by Glenn Curtiss in that same year, and in July the Navy had received its first planes. One of these came from the Wright brothers and two from Curtiss. In 1912 and 1913 the chief center of activity was near the Naval Engineering Experiment Station, also at Annapolis. A series of tents

sufficed for quarters and hangars. During the winters of those years, work was performed with Curtiss at San Diego and at Guantanamo with the fleet.

The first enduring headquarters, soon officially labelled "the Naval Aeronautical Station," was erected in January, 1914, and after at the former navy yard on spacious Pensacola Bay. The locale was recognized by naval planners as well suited for aviation purposes because of a climate that was equable all year 'round, ample sheltered water with but slight tidal changes, plenty of room, and the presence of a number of barracks, warehouses, and other facilities. The enthusiastic expectations of its proponents were to be borne out admirably in the years and decades that followed.

With the continuation of war in Europe and the possibility of submarine attacks upon American shipping, the General Board of the Navy on June 24, 1916 recommended a full-blown system of offshore patrol stations. In all, twelve were desired, roughly on the basis of one for each naval district. Each station should have seven "hydro-aeroplanes." By November the Board was talking of even more stations than that, and said that each one should also have a non-rigid dirigible. The national defense boom of 1916, with its major enlargements of the Army and, especially, of the Navy, included an act that to some degree bore upon the question. The measure, adopted on August 29, provided for

¹ This paper is founded upon research done while the author, a reserve officer, was a member of the history unit of DCNO (Air). Important sources have included the files of the Secretary of the Navy, the General Board, the old Bureau of Navigation and the Bureau of Aeronautics, all of which are in the National Archives. In addition, the files of the Office of Naval Records and Library, comprising a collection of the most valuable naval materials and admirably sorted and indexed, were found particularly useful. This material is also in the National Archives. Besides letters, orders, etc., it includes a number of manuscript histories of naval aviation prepared at the close of World War I, such as sketches of the individual European bases (by members of their staffs) and the two little volumes of Lt. (j.g.) Charles E. Mathews: *Training in America* and *Patrolling Stations on the Western Atlantic*. For the 1919-1939 era, printed materials were relatively more important.

RECEIVING HIS A.B., A.M., and Ph.D. degrees at Brown University, Dr. Spencer was for a time instructor in history and state director of the Historical Records Survey. During the war he served as a gunnery officer in the Armed Guard in the Pacific, and later was stationed in the office of Naval Aviation History at Washington. Now an associate professor and head of the department of history at Kalamazoo College, he has contributed many articles to historical magazines.

a Commission on Navy Yards and Naval Stations. This agency, headed by Rear Admiral James M. Helm, did examine the needs of the Navy in general, but gave little or no assistance to the embryonic naval air service. However, the Chief of Naval Operations on February 5, 1917, asked the Secretary of the Navy for the immediate establishment of eight patrol stations, to be strung out from Massachusetts Bay to the Canal zone. By March 20, a joint Army and Navy board recommended a number of general areas as suitable ones in which sites might be chosen, and ten days later the Navy Department had estimates ready for eleven stations, roughly in the regions urged by the joint board. Yet this was not getting things done very speedily. War was in fact but a few days removed.

Impatient at the government's failure to act, college students and other private citizens in the northeastern states were on their own initiative preparing to set up Aerial Coastal Patrols. Foremost among these new-fangled minute men were those of the Yale unit, that mother of high aviation officials of later years. It included F. Trubee Davison, Artemus Gates, David Ingalls, and Robert A. Lovett. There were others such as the Princeton unit (including James V. Forrestal), the Harvard group, and so on. There were also two little bases at Squantum, Massachusetts, and Bay Shore, Long Island, established by the naval militias of Massachusetts and New York respectively.

So it was, then, that the federal government, despite all plans, had only one naval air station built or even a building when we entered the struggle. And why have more? There were only 38 pilots and 163 aviation ratings (plus 5 officers and 30 men of the Marine Corps). There were only 54 planes, none of them suited to war needs. Such was preparedness!

Then came the flood. Within about a month, the little college groups, some of them already in the naval reserve, had been absorbed into active service and their temporary bases had been put under the command of naval officers. Training units were also established at the Curtiss school at Newport News and at the Curtiss company's Buffalo plant, and other temporary arrange-

ments were also made. Squantum and Bay Shore, the two militia posts, were soon built into substantial federal schools. As the war went on, ground schools were set up successively at the Massachusetts Institute of Technology, the University of Washington, and the Dunwoody Institute at Minneapolis. Preliminary flight schools, besides Bay Shore, included Akron (for balloon and dirigible work), Miami, Key West, and San Diego. Pensacola handled the bulk of advanced flight training, while Rockaway was used for advanced kite balloon practice. With the rise of this comprehensive program, all of the makeshifts of the first months were sloughed off.² Yet the makeshifts, starting with their one or two planes and about the same number of trained flyers, constituted the acorn out of which (with Pensacola) the sturdy structure of naval aviation personnel was to grow. Three other establishments erected in the United States during the war deserve mention. The Naval Aircraft Factory, a permanent structure in the Philadelphia Navy Yard, had some 4,000 employees and was used largely for assembly work. The United States Helium Production Plant, at Fort Worth, was begun during the war but not finished until later. The Anacostia Naval Air Station, built in 1918, was intended principally to provide an experimental seaplane station near to the technical offices at the capital.

Of greater interest was the rapid building of patrol stations. By the day war was declared the joint board for the selection of sites had recommended eight general areas on the Atlantic and Gulf coasts, three on the Pacific, and one (Coco Solo) in the Canal Zone. Some of these were to be used jointly with Army Aviation. When the test came, however, the Navy acted by itself and there was no protest from the other service. Stations were built at Chatham Port (instead of Provincetown, which the board urged), Mon-

² There were also such establishments as the Ground Officers' School and the Aviation Machinists' School, both at Great Lakes, the Gas Engine School at Columbia University, and the Liberty Motor School at the Packard Co. Marine flyers were trained at the Philadelphia Navy Yard and then later at Miami, Quantico, and Parris Island, but the two latter bases were not finished.



Official U. S. Navy Photograph

AT THE U. S. NAVY'S FIRST AIR BASE

Naval aviators hauling up a Curtiss pusher single pontoon seaplane onto the beach at Annapolis, Maryland, in 1912.

tauk, Rockaway, Cape May, and Hampton Roads, so as to offer unbroken coverage for the approaches to the busy maritime centers of the northeast. At all of these there were both dirigibles and seaplanes. Further south there were large gaps. Bases recommended for Savannah and Galveston were not built as a part of the initial program, but some patrolling was done by the school stations at Miami and Key West.³ Coco Solo was equipped for both heavier-and lighter-than-air craft. No patrol bases were erected on the west coast, although San Diego, primarily a training center, carried on some of that type of activity.

This was the first wave of base-building, carried to substantial completion by the late spring of 1918. At that time, in May to be exact, there came positive information of Germany's decision to wage a submarine campaign in our waters. Out of plans already made and because of this new incentive,

³ To say nothing of Bay Shore, Long Island.

orders were given for bases at Morehead City, N.C., Brunswick, Ga., and Galveston. None of these establishments was finished by the armistice.

In between the regular seaplane bases, many points were designated for rest and refueling. The idea of rest stations was not new. In France, they were called "places de combat." Captain Noble E. Irwin, Director of Naval Aviation, once described the typical unit as a "shanty like a life-saving station where a seaplane can land." Water, fuel, oil, spare parts, and tools were stored for the use of planes at the end of long flights from their parent bases. By the close of the war, thirteen had been set up or at least begun, ranging from Nantucket to Indian Pass, Fla.; most of them were in the Carolinas and Florida, where main bases were few and far between. Two kite balloon stations were also erected during the war, one at Marginal Parkway (Brooklyn) and the other at Charleston, S.C.

Outside of the United States and its pos-

sessions, but short of Europe, we put up seaplane stations at Halifax and North Sydney, Nova Scotia, and at Ponta Delgada in the Azores. The latter was a Marine enterprise.

In summary, we located bases where they were most needed. In the first twelve months of war, the float planes that were used stayed fairly close to shore. With the new powerful flying boats that were coming to hand in June, 1918, it was possible to patrol as much as 75 miles out, and all the principal shipping foci had such coverage. The more extensive program adopted to combat the submarine menace in the middle of 1918 produced a string of bases that, with gaps in the Gulf of Maine and off South Carolina, kept a fairly thorough watch all the way from the Gulf of St. Lawrence to a point north of Tampa. Had Port Arthur been built and Galveston finished, these and the Pensacola patrols would have extended at least a thin surveillance well towards the Mexican border. Despite the natural need to safeguard our own coasts, the principal problem lay "over there." The critical submarining of Allied and neutral shipping off the coasts of Europe came all too close to bringing England to her knees. It could also have prevented the arrival of our troops on the Western Front.

The Navy Department had made no plans for aviation in Europe, but when the little First Aeronautical Detachment arrived in France on June 5 and 6, its head, Lieutenant Kenneth Whiting, jumped into the breach with great nerve. Aided by one or two other officers, he soon committed the United States to the founding of one training base, one bombing station (at Dunkirk), and two patrol stations, and began discussions regarding a whole string of seaplane, dirigible, and kite balloon stations which should mesh in with the pattern of French-operated bases. Had Vice Admiral Sims and the British Admiralty been consulted, probably the ultimate program for *la belle France* would have been somewhat less robust; all of Whiting's acts were finally approved by both Sims and the Department, however, and the French bases were the first ones to go into operation.

In all, France saw eight American seaplane stations, three dirigible stations, and

two kite balloon bases (not including Brest, which was also a seaplane base). These operating units ranged from Brittany to the Bay of Biscay. On the Channel shore of Brittany were Treguier, L'Aber Vrach, and Brest, all seaplane stations (except that Brest also had balloons, as noted), and Guipavas, a dirigible unit. On the southern side of the peninsula and north of the Loire were Ile Tudy (seaplanes) and La Trinite-sur-Mer (kite balloons), and, near the river's mouth, Le Croisic. Located on little inlets surrounded by tides that rose and fell so markedly as to call for the use of derricks to handle the craft, the seaplanes and flying boats from Le Croisic were welcome sights to the myriads of troops aboard transports coming in to St. Nazaire. South of the Loire were seaplane bases at Fromentine, St. Trojan, and Arcachon, dirigible stations at Paimboeuf and Gujan (southernmost of all, and never fully finished), and the balloon basing point at La Pallice.

The kite balloons, as veterans of World War I will in many cases recall, were sausage-shaped affairs that were towed at altitudes of several hundred feet by destroyers and other surface craft. The observer in one of these balloons could see perhaps twenty miles farther than a man on the bridge of a destroyer. The kite balloons were prepared and inflated at the shore bases. The dirigibles were best for convoy escort, since they weren't of much use by themselves for attacking submarines. If the engines broke down, there was always the consoling thought that they would drift back to the French coast with the prevailing winds. Whatever shortcomings the lighter-than-air craft had, they helped to supplement the short-range and rather frail airplanes of the day.

Vital for these operating bases were Moutchic and Pauillac. The former was the bombing and aerial gunnery school (to say nothing of supplementary flight training), located on Lake Lacanau, four miles from the ocean and thirty-two from Bordeaux. Pauillac, quite near Bordeaux, was the receiving barracks, assembly and repair base, and supply depot for all of these stations. It had a deep-sea dock and good rail connections and in time embraced some seventy buildings and 7,000 blue-jackets. The expectation was that



Official U. S. Navy Photograph

EARLY DAYS AT PENSACOLA

The flight beach at Pensacola in 1914. Note the tent-type hangars.

\$200,000 worth of aviation materials could be sorted, assembled, and moved out daily.

Actually, despite such conveniences as the use of portable, prefabricated wooden huts, building proceeded slowly. Roof parts were invariably said to arrive before the walls did, and materials wanted in France journeyed even so far afield as to Cardiff and Dublin. Commander Hutchinson I. Cone, later in charge of U. S. Naval Aviation Forces, Foreign Service (successor to the First Aeronautical Detachment), eventually acquired two little steamers, the *Bella* and the *Mecknes*, some schooners, and a fair number of trucks, for transportation purposes.

In Ireland, Cone decided upon four seaplane stations. Three of these were on the south coast: Whiddy Island, called the Bantry Bay station, guarded the western end; Queenstown (also an assembly and repair unit) covered the central area; and Wex-

ford patrolled the southern approach to the Irish Sea. On the northeast corner was Lough Foyle, near Londonderry, to protect the northern entry into that sea. Berehaven (or Castletownbere) was a kite balloon base near the mouth of Bantry Bay.

Although there was much planning for operating bases in England, the only one built was at Killingholme, located on the North Sea just above the Humber. Original plans were for this to be the starting point for a mass bombing raid upon the German home naval bases. Some eighty lighters, each bearing a large flying boat, were to be towed by destroyers until near the enemy coast; when close up, the barges would be tilted by flooding the rear compartments and the planes would take to the water. Although heartily backed by the United States and Britain, its joint sponsors, the project fell through because our Allies were observed while making tests in the vicinity of Heligo-

land Bight. Thereafter Killingholme was merely one of our most powerful seaplane bases.

Negotiations with Italy regarding naval aviators were based on the Italians' hope that we would train flyers for service in their country. Disabused of this expectation, they agreed to train some for us, expecting the men to be employed against Austria. Here, too, they were partly disappointed. Yet an agreement was made between their naval aviation head and Lieutenant John Lansing Callan, a reserve flyer who had been in Italy for the Curtiss company, to establish two seaplane stations and a school. Italy did the building. Of the operating bases, Pescara was never finished, but Porto Corsini, near Ravenna, sent out coastal patrols and bombed the Austrian naval center at Pola. The school was at Lake Bolsena, sixty miles northeast of Rome.

After the collapse of the towed-lighter undertaking, the pet project was to destroy the German submarine bases at Ostend, Zeebrugge, and Bruges by massed squadrons of land-type bombers flown by naval and Marine aviators. The same sort of thing had been intended, on a smaller scale, when Lieutenant Whiting had agreed to the establishment of Dunkirk. Our unit there, indeed, was composed of seaplanes assigned to the bombing of U-boat pens. After some discussion with the Army over cognizance, the new program was set up. An assembly and repair base was established at Eastleigh near Southampton. From there, planes were ferried across the Channel to the operating bases constructed in the Calais area. These were St. Inglevert and Campagne, used for the Navy squadrons that made up the night bombing wing, and La Frene and Oye, which housed the Marine squadrons. The latter composed the day bombing wing. The headquarters of the entire Group was at Autingues and there was an advanced repair base at Guines. Dunkirk continued to be used for a certain amount of bombing by seaplanes.

Counting each base only once, although some had more than one function, we had fifteen European stations primarily for seaplane and flying boat operations, four for landplane bombing, three for dirigibles, three for kite balloons, two schools, two main

assembly and repair bases and one advanced repair base, and one field headquarters unit. On November 11, 1918, our naval air forces in Europe included 1,147 officers and 18,308 enlisted men, 400 airplanes, 50 kite balloons, and three dirigibles. In all, the establishments were valued at \$10,889,658. Of this, \$5,862,753 was the estimated worth of the structures put up by the Navy, in contrast to building done for us by our European associates. It was figured that the hangars alone would cover forty city blocks and that their cubic content was ten times that of the Woolworth Building. If this be added to the accomplishments in the line of schools, production facilities, and patrol bases in the United States, Canada, the Canal Zone, and the Azores, the record was more than merely impressive. It was the typical American story of a lavish outpouring of wealth and skill. We had come a long way since April, 1917.

The flood of preparations which had swelled in since the start of hostilities now ebbed out, slowly at first and then faster and faster. Rolling up the European bases presented no problems of policy, since we were not to retain any of them. Motors that were in good condition, instruments, aircraft not yet unboxed, and some other items were shipped back. Personnel were detached quite rapidly. The portable standard buildings were easily dismantled, those from the Northern Bombing Group being sold on very favorable terms to the Commission for the Relief of Belgium. By February 15, 1919, all of the French stations had been demobilized. The Irish bases were shut up by March 15.

The chief problem was that of real estate. In Italy, this did not apply, because we had merely borrowed facilities erected for us by the government of that country. Nor did the Northern Bombing Group, with its light structures, offer much trouble. For the British and the regular French bases, however, we were faced with such charges as for cost of construction, rental of land and buildings, damages to same, contract-termination, transport, etc. In brief, we lost the greater part of the amount we had put into these establishments. Many of the sites simply lay unused for years after. Four of the French bases—ones which had been used for French

naval aviation originally—were now so employed again. Moutchic became a private sanatorium. Even in 1921, however, a number of station sites were still in our hands, unsold.

For the "Zone of the Interior" (in the argot of post-World War II), the problem was not one of clearing out but of hanging on. On the day after the armistice, it is true, it was reported in the Director of Naval Aviation's office that the Secretary intended that those bases which were built or building should be held lastingly. It was suggested that two assembly and repair bases like Pauillac, using machinery that had been employed abroad, be set up on the U. S. east coast. Far more than this, however, plans called for now at last carrying out the General Board's program of July and August, 1918, as modified by discussion since then. On the Atlantic and the Gulf, this meant such items as the projected dirigible stations at Macchias, Me., Charleston, S.C., and Port Arthur, Texas. In the Caribbean, bases were wanted at Guantanamo Bay, Cuba, Samana Bay, Santo Domingo, and St. Thomas, V.I. For the Pacific, the plans were those of the Board, calling for regular bases at San Francisco, Port Angeles (Ediz Hook), Wash.; the Columbia River; Seward, Alaska; Pearl Harbor and Hilo, Hawaii; Port Apra, Guam; and Cavite, P.I.; plus some twenty-five refueling stations. The Navy had postponed construction of the Pacific bases because they were not needed at the time and because the chief Asiatic powers were our *de facto* allies.

Rather brashly, Captain George W. Steele, Jr., went before the House Committee on Naval Affairs on November 27 to ask for a cool \$225,000,000 for naval aeronautics, part of that sum being for new shore bases. He found the committee far from enthusiastic. "But what is the need of patrol work, in time of peace and in 1920?" the chairman asked. That was not the worst. By early in February a bill had been reported that banned the Navy from maintaining more than six coastal stations for heavier-than-air craft. The drive for this enormous reduction stemmed from three factors. First was the public demand for economy, which grew more stern with each month and year. Secondly, the Navy itself wanted aviation to

become shipborne, and failed to realize what a large reliance upon shore bases would still be entailed. The third element was the rivalry of the Army Air Service, which will be alluded to below.

The Navy made efforts to have the numerical restriction avoided or even to insert the word "patrol" before "stations," but it was in vain. The appropriation act of July 11, 1919 forbade the use of funds "for maintenance of more than six heavier-than-air stations on the coasts of continental United States." The Navy did, indeed, class Chatham, Montauk, and Cape May as solely for lighter-than-air purposes. It also chose to consider Lakehurst (a dozen miles from the sea) as not "coastal," which was normal enough for the time; of course, Lakehurst was also strictly a "lighter-than-air" base. A third way out was to consider Anacostia and other experimental bases such as Newport and Dahlgren as not "stations" within the meaning of the act; that is, to consider the word "patrol" as implied. It must be recalled that three new stations were desired for the Pacific coast, which implied that only three would be left for the East. The restrictive provision continued in the annual appropriations for 20 years, that for the fiscal year of 1940 being the first without it.

Another limitation, but also reflecting the push "back to normalcy," was to the effect that no money be spent to construct a factory to make naval aircraft; this did not prevent the continuance of the establishment at Philadelphia. All in all, the law was virtually a "fundamental act" or constitution, for it also provided for converting the collier *Jupiter* into our first carrier, the *Langley*, changing two merchant ships into aircraft tenders, and erecting two large dirigible hangars. Most significant for shore base work, however, was the size of the total appropriation for naval aviation. This totalled \$25,000,000, or exactly one-ninth of what Steele had asked for in November!

With these rules to guide him, the Secretary directed sweeping reductions. Hurry-up orders went out from his office in November, 1919. By the following January the surviving continental heavier-than-air stations were Rockaway, Anacostia, Hampton Roads, Pensacola, Key West, and San Diego, that



Official U. S. Navy Photograph

FLYING A KITE IN WORLD WAR I

U. S. Navy aviators launching a kite balloon at the U. S. Naval Air Station, La Trinite, France.

is, the maximum legal number. There were also the Marine units at Quantico and Parris Island, NAS Coco Solo, and the lighter-than-air bases at Chatham, Cape May, and Lakehurst, the latter rather newly started. All ground schools except Great Lakes (for mechanics) and Pensacola had been closed. More cuts followed. In fiscal 1920, Key West was closed and returned to its owners and Chatham also was shut up. In fiscal 1922, Cape May, Rockaway, Yorktown (little more than a branch of Hampton Roads), and Parris Island were closed.

A further serious trouble arose from Army Air Service rivalry. In the original Army appropriation bill for fiscal 1922 there was inserted a clause that gave the Army Air Service charge of "all aerial operations from land bases," leaving the Navy only "aerial operations attached to a fleet." After conference of naval air men with Senator Wadsworth, the bill was amended to read "including shore stations whose maintenance is necessary for operations connected with the fleet, for construction and experimentation,

and for the training of personnel." The bill was enacted in that form on June 5, 1920. Although the Navy protested, the measure stood. Its chief effect was to give the Army legal charge of anti-submarine patrols. As a matter of fact, however, the Navy did not conform in full. For example, a secret memorandum on naval air stations, dated September 18, 1922, gave the missions as including "reconnaissance and patrol," "convoy operations," and attacks upon all enemy craft whether on the surface or above or below it. The Chief of the Bureau of Aeronautics admitted approximately this to the Senate Naval Committee in 1924.

The Army not only complained of the Navy's attitude but also made direct attacks. Billy Mitchell, that stormy petrel of the Army Air Service, in 1920 proposed that some thirteen stations of the Navy be consolidated with nearby Army facilities. It was hard to scratch together a list of thirteen, but he included such tiny facilities as that in the navy yard at Portsmouth, New Hampshire, and he even named one (at Culebra)

had never existed.⁴ This proposal of a dirigible base was not adopted! There was, in fact, much discussion of joint use of certain facilities by both services, and throughout most of the years between the wars the two did use the North Island (San Diego) and Ford Island (Pearl Harbor). In 1935, both of these islands were turned over to the Navy for its exclusive use, the Army receiving a valuable part in the deal. This had been a naval dirigible station. Aside from this rather favorable bargain, relations with the Army on the base question were throughout rather unpropitious.

At the close of the First World War, dirigibles appeared to have exceptional promise, especially for naval reconnaissance. In keeping with this concept, the General Board on June 23, 1919 recommended the early erection of a major construction and operating base (at which the service could build its own rigid airships), a Hawaiian operating base, and a program of two such craft for each of battle squadrons. Contracts were let for Lakehurst's huge hangar (big enough to hold Woolworth Building lengthwise) in September, 1919. The base was finished by July 1922. Eventually, in 1931, Sunnyvale was authorized, intended as the west-coast twin of Lakehurst. It was completed in 1933. Commander Rosendahl termed the site as nearly ideal as a dirigible base could be, superior to Friedrichshaven and to the two British bases that existed. The Fort Worth blimp plant was completed soon after the war; two subsequent helium plants, owned by the Department of the Interior, were set up at Petrolia and Amarillo, Texas. Meanwhile, mooring masts of a semi-portable type were erected at Fort Worth, Guantanamo, San Diego, and Camp Lewis (near Tacoma); in October, 1924 the *Shenandoah* was able to make a flight around the world. Later Miami was also given a mast. Between 1919 and 1922 there did come a new building of heavier-than-air bases, but it was quite unsystematic. In 1920, small facilities were set up on Gould Island, near Newport, for experiments in torpedo-dropping. Between 1919 and 1921, a rather similar

unit, designed for tests with bombs and guns, was set up on the lower proving grounds at Dahlgren. Of far more import were the Pacific establishments. The Pearl Harbor naval air station was set up in 1920. In January, 1921, Flight L, a Marine unit, was on its way to Guam; by the time the Washington Naval Treaty of 1922 froze the existing situation in the Far Pacific, a base at Sumay on that island was about finished. Under the terms of the treaty we were pledged not to develop facilities in Samoa or the Philippines. Even without this ban, however, it is possible that Congress would have refused the money to build any.

The sporadic development of the first post-war years gave way in 1923 to an era of planned development. Budget cuts had by that year reached their limit, the figure for fiscal 1922 having been \$13,413,431 for all naval aviation, as compared to \$25,000,000 for 1919. The 1923 idea was to spend fixed (and modest!) amounts annually over a long period. A specific pattern for this expenditure was marked out by the board headed by Rear Admiral Hugh Rodman in a report of January 13, 1923.

The Rodman Board did not envision a continuous chain of patrol bases, but rather enough new establishments so that each major fleet base and advanced base should acquire an air station in the near future. Aside from San Diego, which was also to be developed, the secondary naval bases were to see little more than the acquisition of air base sites, if such were thought needed. All major units that already existed were to be retained. The principal changes entailed, then, were to be the expansion of the bases at Rockaway (or some place near by), Hampton Roads, Pearl Harbor, Coco Solo, and San Diego, and the building of bases for the first time at Alameda and Sand Point. Presuming that there might be twenty years of peace, which would mean through fiscal 1944 (!), and that \$16,500,000 would buy such expansion of our shore bases as was needed, it was thought that an annual expenditure of \$825,000 would be enough. Proceeding upon these optimistic assumptions, which an over-thrifty Congress had forced upon it, the Rodman Board specified the exact sums to be spent at each base fiscal

⁴ Actually, Mitchell had spoken of "Culebra, C. Z.," as the Navy's interest was in the island of Culebra.

year after fiscal year over this long period. Coco Solo and Pearl Harbor, for example, were to receive large grants during 1925-1929 and 1925-1931, respectively, and smaller sums in 1933 and 1933-1934, respectively. As with any rationing, there was a merit of system, the only trouble being that when the patient received less than the required total of calories he might die.

Sand Point, Seattle, which had top priority, was brought under naval lease in 1923, and was long used jointly with the Army. Contracts for permanent structures were not let until 1928. Until 1928 and after, indeed, the base program lagged generally. Congress did not fulfill the terms of the 1923 schedule. In fiscal 1925 only \$560,000 was appropriated and in the next two years nothing at all. After that, things went better, so that by July 1, 1930, virtually all of the deficit had been made up. Alameda, however, had not been started, and Pearl Harbor and the Marine field at Quantico were practically forgotten. In the late 1920's, as the act of 1926 calling for 1,000 "useful" naval planes began to show results, our air fields became seriously crowded.

A program of naval reserve establishments, very tiny in size but from the long-range viewpoint worth their weight in gold, was begun in 1923. Rear Admiral William A. Moffett, first head of the Bureau of Aeronautics, was the backer. Fort Hamilton, N. Y. (later moved to Rockaway), Squantum, Mass., and Great Lakes, Ill., received units in 1923; by 1928 Sand Point, Long Beach, Oakland, Grosse Ile, and Minneapolis were all participating. Municipalities and other non-federal sponsors were giving useful aid to a budget-thin Navy. Significant of the technical changes that were transpiring was the fact that all of the later bases consisted of fields for land planes rather than stretches of water for float or flying-boat types.

Following the lean⁵ years of 1925-1927, things were never so bad again. While the

plans of the Rodman Board remained substantially in effect until 1938, appropriations were more plentiful throughout the 1930's. During the nine fiscal years after July 1, 1930, the total of \$14,689,000 was spent on new building via appropriations made by Congress specifically for air stations. This nearly equalled the total planned in 1923 for the next twenty years. The appropriations of 1931-1933 doubtless reflected the deepening depression of that late Hoover era and the demand for public works to create employment. Beginning with 1933-1934 came a flood of relief money as such, spent for bases under the relief appropriations of the NIRA, PWA, and WPA. In all, \$36,368,148 was employed for naval air bases under these headings; while more might have been done through regular appropriations, and while much of the expenditure went for maintenance, these figures cannot be slighted.

None the less, affairs were not in too rosy a state. In the first place, the Rodman concepts were too limited even by 1923 standards; that is, even in view of the small size of the landing fields and other modest requirements of the day. Secondly, the quality and elaborateness desired had increased very greatly. Expensive machines called for good overhaul facilities, more safety devices were needed, and so on. A third factor was that standards as to the size of the bases and the volume of buildings had increased along with major increases in the number and size of aircraft. What happened is shown for Alameda and San Diego in 1924-1939. The 20-year program spoke of total costs of \$1,303,000 and \$515,000 respectively. The amounts actually allotted, by specific appropriations, were \$5,525,000 (for the first two years alone) and \$1,420,000, to say nothing of relief expenditures.

A valuable governing factor was the Master Priority List, first submitted on July 30, 1931, and put into effect fully in 1932. This was prepared by the Board for the Development of Navy Yard Plans (which was in 1934 replaced by the Shore Station Development Board). Each station first gave priorities to its own projects, but the Board set priorities as a whole. In the middle 1930's, military installations were given priority over housing, and outlying bases were par-

⁵ There was a modest expansion of activity in the Caribbean and Central America, temporarily, as the Marine Corps established little fields in Santo Domingo, Haiti, and Nicaragua in connection with American intervention in those countries between 1919 and 1934. This is to say nothing of Tsin-Ho, the Marine air base near Tientsin.



Official U. S. Navy Photograph

U. S. NAVY OVERSEAS AIR BASE IN WORLD WAR I

Seaplane hangars at Paulliac Giranda, France, in 1918.

ticularly likely to have their projects near the top of the huge list.

The Vinson-Trammell (or "Treaty Navy") Act of 1934 accelerated the expansion of aircraft procurement and also of bases, an expansion already under way.⁶ More planes meant larger fields and more of them. In 1931 and thereafter, it was requested that auxiliary fields leased near Hampton Roads, Pensacola, and San Diego be purchased, but this was not done. Yet by 1935 eleven satellite fields were under lease at San Diego, while in fiscal 1938 nine various parcels of land were under lease near Pensacola. Some easement was provided through the acquisition of virtually all of North and Ford Islands in 1935, as alluded to above, and since the LTA plans had died with the dirigibles that they had been founded upon, the shift of Sunnyvale to the Army was not regretted

⁶ The act of 17 May 1938, providing for a post-treaty navy and for 3,000 "useful" naval aircraft, essentially marks the beginning of the eve-of-war preparations and should be linked with the Hepburn Act of later in that year; in other words, it lies beyond the scope of this paper.

very much. Those establishments that received a million dollars or more were Norfolk (formerly Hampton Roads), Pensacola, Seattle, San Diego, Lakehurst, and Sunnyvale, all Naval Air Stations, Coco Solo and Pearl Harbor, both of which were in 1931 designated Fleet Air Bases, and the factory at Philadelphia. But even the naval reserve air bases were built up more substantially.

Most important of the new bases set up before the Hepburn report was Alameda, in San Francisco Bay. The site included the Army's Benton Field, but most of the land was obtained by filling. Authorized in 1936 and first contracted for in 1938, it received a high priority. The land for San Pedro was made available by municipal authorities in 1935 and a first broad contract was completed in 1937. The new base helped to relieve the congestion at San Diego. San Clemente Island, northwest of San Diego and long used (with an earthen landing strip) by the Marines for battle maneuvers, was in 1937-1939 developed as an auxiliary base. The Fleet Air Base at Sitka, commissioned in 1938, had no landing field; it was intended



Official U. S. Navy Photograph

THEY PIONEERED DESPITE INADEQUATE FACILITIES

This patrol squadron was making one stop flights from Coco Solo to San Diego in 1934, although facilities at Coco Solo recommended by the Rodman Board were found still lacking by the Hepburn Board.

solely for seaplanes. Guantanamo, Cuba which had seen naval air business as early as the winter of 1912-1913 and had had some simple construction done from time to time later, in 1937-1939 was developed in a major way. The field on McCalla Hill was much enlarged and seaplane facilities were installed in Corinaso Cove, just below. In 1935, a Marine observation squadron was stationed at St. Thomas, V.I., and construction of a small permanent establishment was provided for. Cape May naval air station was partly reopened in 1938, to help relieve Norfolk, while Parris Island was kept in reasonable repair and was at times used by Marine aviators and ground troops.

Of the existing naval reserve air bases (so termed in 1930 and after, except that those housed with naval air stations were called naval reserve air units), Rockaway was supplanted by Valley Stream and the latter by Floyd Bennett, Seattle received a new site, and Great Lakes was replaced by Glenview. New were St. Louis, Opa Locka (Miami), Kansas City; units were also set up on the naval properties at Philadelphia and Anacostia.

On the eve of the Hepburn report, made on

December 1, 1938, the naval air establishment thus included seven Naval Air Stations (Lakehurst, Anacostia, Norfolk, Pensacola, Seattle, Alameda, and San Diego),⁷ four Fleet Air Bases (San Pedro, Coco Solo, Pearl Harbor, and Sitka—the latter only for seaplanes), thirteen Naval Reserve Air Bases or Units, three Marine establishments (Quantico, St. Thomas, and Parris Island—the latter only partly active), plus the Naval Aircraft Factory and six or seven minor "facilities" or "detachments."⁸

The picture was better than that envisioned by the Rodman Board in the penny-pinching 1920's. One exception was the lack of an air base in the Narragansett-New York region, but the major fleet base upon which it had been predicated had not been put up there, either. On the other hand, whereas the 1923 plans spoke of acquiring sites in the eastern West Indies and Alaska, by 1938

⁷ This omits Chatham and Cape May, both undeveloped and largely inactive.

⁸ The latter included: San Clemente (Fleet Training Base); Flight L, U.S.M.C., at Guam; facilities at Guantanamo and at the Charleston and Puget Sound Navy Yards; and the detachments at Gould Island (Narragansett Bay) and Dahlgren.

we had establishments in being at Guantamano, St. Thomas, and Sitka. The other phases of the Rodman plan had been fulfilled also. In addition, we had developed San Pedro and San Clemente. The reserve base program, set up in 1923, although not as a part of the Rodman picture, had also exceeded expectations. Mention may be made also of six little stations under the wing of the Coast Guard, at Salem (Mass.), Floyd Bennett, Cape May, Elizabeth City (N.C.), Charleston, and Miami, although these were to a great extent in the same locations as various naval air units. While the Hepburn Board thought them of little use for cooperation with the fleet, they did later prove valuable for anti-submarine patrols.

To judge the situation by the plans of 1923, however, is absurd. Total war was on its way. Before the Hepburn report was made, the western world had known the humiliation of Munich. The "new order," whether in Europe or in Asia, was no longer a laughing matter. Yet the Board had to report that there were serious gaps in the network of bases and that a great over-all expansion was needed. Even the existing major bases had short-comings. Consider a single example, the case of Coco Solo, which the Rodman

Board had rated as the most important single station of all. Throughout most of the 1920's and 1930's the chiefs of the Bureau of Aeronautics had recommended year after year that the Margarita breakwater there be extended, so as to provide quiet water for seaplanes. Yet the Hepburn Board found this still wanting.

At about the time of the submission of the Hepburn report, a new era dawned. The sweeping recommendations of the Board, calling for a large number of important new stations, found a receptive ear in Congress. An act of April 25, 1939, provided \$65,000,000 for naval air bases. This is to be compared with \$14,848,000 for the period 1920-1930 as a whole and \$50,859,148 for the fiscal 1931-1939. In other words, it amounted to about as much as had been spent in the entire period since the First World War. Symbolic, too, was the elimination a month later of the historic restriction in the annual naval appropriation bill, as to the number of coastal stations for heavier-than-air craft. For the first time since 1920, the Navy was legally entitled to have more than six such bases. At long last, the naval air establishment could prepare for the war that for some years had been on the horizon.



AND THE BAND PLAYED ON . . .

Contributed by LIEUTENANT COMMANDER H. B. SEIM, *U. S. Navy*

In the early days of the "unofficial war" in the Atlantic in 1941 the light cruiser *Memphis* arrived in Pernambuco, Brazil, to establish the neutrality patrol in the South Atlantic. Since the wartime curtailment of ceremony was not yet effective, our Admiral's orders to the Officer-of-the-Deck were explicit: "Appropriate honors shall be rendered to all visiting civilian and military officials. When in doubt, it is better to give too much than not enough."

In spite of lack of familiarity with Brazilian uniforms, the watch officers performed ably and creditably—that is, until Bob McCarthy relieved the watch at noontime.

The Admiral and his staff were snatching a quick lunch when Mac spotted an approaching "dignitary," resplendent in sky blue jodhpurs and white tunic liberally splashed with gold braid.

"Give him the works!" shouted Bob. The boatswain's pipe shrieked and the band played a spirited march as the Admiral and his staff puffed and chewed their way up to the quarterdeck to receive the visitor. He seemed quite impressed and somewhat embarrassed by the reception, but shook hands congenially with each of the assembled Brass Hats and finally worked his way down to a Portuguese-speaking seaman who was acting as interpreter. The two carried on a short conversation while all hands waited for enlightenment.

Then the sailor turned to the Admiral, and, with a hint of laughter in his eyes, announced, "He says he's a policeman sent to patrol the dock!"

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS).



Official U. S. Navy Photograph

WHEN IT'S ALL-IMPORTANT TO KNOW WHERE YOU ARE
Carrier and plane navigators cannot risk the reckoning of Columbus, whose navigation was in error by thirty-two per cent.

THE NAUTICAL MILE

By LIEUTENANT COMMANDER ALTON B. MOODY
U. S. Naval Reserve

THE NAUTICAL mile, familiar as it is to any seaman, is but little understood by most of them.

Of course, one of the most elementary lessons the neophyte sailor learns is that a nautical mile is equal to one minute of latitude. This definition, found in nearly any textbook on navigation, is sufficiently accurate for ordinary purposes, but it is grossly inadequate for scientific purposes such as calibration of instruments or surveying, since a minute of latitude varies from 6,046 feet at the equator to 6,108 feet at the poles.

For such purposes a standard value is needed. The average length of one minute of latitude might do, if we knew precisely the size and shape of the earth. But we do not know this with sufficient accuracy—nor for these days when the Bureau of Standards speaks in terms of accuracy to within 0.000,000,000,000,000,2 inch (measured by means of the wave length of a certain form of mercury produced at Oak Ridge).

Then just what is a nautical mile, and where and when did it originate?

PRIMITIVE UNITS

Early man, seeking units of measurement, logically looked about him for something in nature that he might use as a standard. For short distances he used the width of his finger, the width of his hand, his span, the length of his foot, his pace (sometimes one, but usually a double, step), or the length of his forearm (a cubit). As these varied between men, so the length of the units differed. The foot, for instance, varied from 11 to 14 inches.

For greater distances longer units were needed. In Greece the length of the Olympic stadium served as a useful unit. This was 600 Greek feet long, but as the length of the foot varied, so did the stadium. In Olympia it was 630.9 U. S. feet; in Attica, 607.9 U. S.

feet, or almost exactly one-tenth of a modern nautical mile.

The Romans adopted this unit and extended its use to nautical and even astronomical measurements. The Roman stadium was 625 Roman feet long, or 606.3 U. S. feet.

The term *stadium* has come down to us today not only to refer to the huge structures used to seat spectators of athletic contests, but also in connection with measurement of distance, in the form of the familiar graduated rod used by the surveyor. In fact, even a graduated stick held at arm's length to determine distance to a remote object is properly called a "stadia."

A modern unit of comparable length to the Greek stadium is the cable, a unit not otherwise related. The cable was originally defined as the length of a ship's anchor cable, sometimes considered to be 100 *fathoms* or 600 feet, about one-tenth of a nautical mile. In the British Navy the length of the cable is now officially set at 608 feet, and in the U. S. Navy at 120 fathoms or 720 feet. Thus, by coincidence, the fathom, cable, and nautical mile constitute approximately a decimal system. The fathom was used anciently as a measure of the outstretched arms, from which the term is derived.

Another and longer unit widely used was the league, which varied from 2.4 to 4.6

A GRADUATE of the Naval Academy in 1935, Lieutenant Commander Moody conducted private schools of navigation in New York and Philadelphia before returning to active duty as instructor of navigation at the Naval Academy in 1941. Since April, 1946, he has been in the Division of Navigational Science of the U. S. Hydrographic Office. He supervised the 1949 revision of Dutton's *Navigation and Nautical Astronomy* and at present is revising Bowditch's *American Practical Navigator*.

nautical miles. Columbus used the Italian *legua* of 4 *miglia* (Roman miles) or 3.18 modern nautical miles. The modern league, now a poetic term, is somewhat indefinite, but is generally considered to be about 3 miles, either statute or nautical.

THE MILE

In ancient times the use of the cubit, foot, pace, stadium, and league seems to have been rather general. But these left a wide gap between the stadium of about 0.1 mile and the league of about 3 miles.

Ancient Greece bridged this gap with a unit of 12 stadia (1.20 nautical miles in Attica), called a *dolichos*. Another unit, widely used during the middle ages, became known as the *Mediterranean mile*. The origin of this unit of 4,035.42 U. S. feet is obscure, but has been attributed to the Greeks. The *Roman mile* of 4,858.59 U. S. feet or about 0.8 nautical mile (6/5 of a Mediterranean mile) became even more widely used and gradually replaced the shorter Mediterranean mile.

There is difference of opinion as to which of these miles preceded the other, but it is probable that the Mediterranean mile came first. However, the term "mile" may have been applied first to the Roman mile, since the word comes from the latin *mille*, meaning thousand. The term was applied because the Roman mile was defined as a thousand paces. This was also the length of the Mediterranean mile and the ancient Arabian *mille* or *mil* of 1.03 nautical mile, or 6,000 Arabian feet. The three units differed in length because of the different lengths of the pace. The Roman *passus* (pace) was considered to be 5 Roman *pedes* (feet) or 4.86 U. S. feet.

It is to be observed that all of these early miles were defined in terms of shorter units, and were in no way associated with the size of the earth. The earth was believed by some to be "round" at least as early as Pythagoras (about 540 B.C.) and by Aristotle's time (384—322 B. C.) attempts were made to define its size. Eratosthenes of Alexandria attempted to measure the size of the earth during the third century before Christ and determined the circumference as 250,000 stadia, which he rounded off to 252,000 stadia so that each degree would have 700 stadia (or 70 nautical miles). But during the cen-

turies that followed, men were concerned more with its shape than with its size.

It was not until the period of the great discoveries, when charts and greater distances became important to the mariner, that the association of units of length and degrees of latitude became a serious consideration.

The lengths ascribed to the miles shown in early chart scales depended upon the size of the earth accepted by the individual. Estimates varied considerably, ranging from about 44.5 to 87.5 modern nautical miles per degree of latitude. The estimates were generally too low.

The Roman mile of 1,000 paces persisted for several centuries, the number of such miles considered equivalent to a degree of latitude being changed from time to time. At the time Columbus made his historic voyages to the New World, 56 2/3 Roman miles (45.3 nautical miles) were generally considered to be equivalent to a degree. The actual size is about 32 per cent larger.

However, even before Columbus, some scholars questioned the size generally accepted. The great book *Syntaxis* by Ptolemy, better known by its Arabian title, the *Almagest*, still being published in the 15th century, 1,300 years after its first edition, considered 62 Roman miles equivalent to one degree. An edition appearing in 1466 contained a chart of southern Asia on which 60 Roman miles were shown to a degree. The chart was drawn by Nicolaus Germanus, author of the 1482 edition which was published in Ulm, Germany. Whether the shift from 62 to 60 miles to a degree was considered a correction or an adaptation to provide a more convenient relationship between the mile and degree is not clear, but this is the first known use of the relationship that has gradually replaced all others. The modern *minute-mile* was thus born quite naturally and unpretentiously.

But the shift to a minute-mile did not come about at once. Originally, 60 Roman miles of 4858.59 feet (0.8 nautical mile) were considered equal to one degree. As later measurements of the earth began to reveal the error of earlier accepted values, two methods of correcting the relationship were common. Some authorities favored retention of the mile without change, and increased

the number of units per degree. But others recognized the logic of dividing the degree of 60 minutes into 60 miles, and many of the earlier units were gradually lengthened.

By 1715 the inaccuracy of the Roman mile was well established. In 1735 an expedition from the Paris Academy was sent to "Peru" (within the present borders of Ecuador) to measure an arc of the meridian, to provide a more accurate determination of the size of the earth. Pierre Bouguer, a member of the expedition, made the following observation: "The Italians use miles, which count as 1,000 geometrical or double paces, each of 5 feet; and they suppose that 60 of these miles make one degree. This method of counting distances is very convenient—but, it is therefore necessary to modify its length, and increase it by approximately one-seventh."

The need for a standard had been recognized for some time. When the log appeared as an instrument for measuring speed, the need became acute. The first mention of the log was by Bourne in his celebrated *Regiment of the Sea*, published in London in 1574.

The log in common use for many years, called a "chip log", consisted essentially of three parts: first, the "log chip" (a thin board in the shape of a quarter of a circle) weighted in such a manner as to float vertically; second, the "log line", a line attached to the quadrant and knotted at equal intervals; and third, the "log glass" or sand glass. The log chip was thrown overboard and the log line permitted to run out freely. As the first knot in the log line went overboard, when the log chip was well clear of the wake, the log glass was turned over. The number of additional knots paid out while the log glass emptied itself bore a definite relationship to the speed.

The original log glass marked an interval of 30 seconds, and the distance between knots was 42 feet. Each knot was considered equivalent to a speed of one nautical mile per hour. This is the origin of the modern term *knot* as a unit of speed. But since the relationship was erroneous, the speed indicated by early logs was too great, resulting in landfalls being consistently late. However, this was generally considered an advantage. Norwood, seventeenth century English geodesist, explained it this way: "The ship's way is commonly more than by the log line ap-

pears to be, and every man desires to have his reckoning something before his ship, that he fall not in with a place unexpected."

As early as 1639 Norwood had shown that the distance between knots was incorrect. The English nautical author Henry Wilson suggested that the length be increased to 48 feet 7 inches, and later he suggested 51 feet. J. Collins had already suggested a length of 50 feet. But the change, when it came, was in the interval of time measured by the log glass rather than the distance between knots on the log line. These remained 42 feet apart, the time being decreased from 30 to 24 seconds. Later the time was increased to 28 seconds and the distance between knots to 47 feet 3 inches.

THE NAUTICAL MILE

Meanwhile, the length of the mile remained controversial. In 1637 in London there appeared a small booklet entitled *The Sea-Man's Practise, containing a Fundamental Probleme in Navigation, experimentally verified*. Norwood, author of the preface of this booklet, had measured an arc of the meridian and writes in the preface that, "It appears not only from this experiment, but even by all others, that there is a greater number of feet contained in a degree than the common opinion, that a thousand paces (of 5 feet) make a mile."

The nautical mile, as distinct from the land mile, might be said to date from this time. Previously, there had been no distinction between the two, but following the appearance of this booklet mariners gradually began to accept the longer mile, while ashore, where there was less incentive to associate the mile with the size of the earth, the old Roman mile of 5,000 feet persisted. The land or statute mile later became 5280 feet, but this length is by no means universal.

As for the nautical mile, Norwood, after his measurement of an arc of the meridian, proposed that the length be established at 6120 feet. He later changed this to 6,000 feet to preserve the custom that "every man desires to have his reckoning something before the ship, that he fall not in with a place unexpected." His mile was gradually accepted by seamen, but it was not known by the distinctive name *nautical mile* until a century later, the expression first appearing in 1730.

ESTABLISHING THE SIZE OF THE EARTH

Although the nautical mile as a minute of a great circle of the earth was now well established, there remained the problem of determining accurately the size and shape of the earth, so that the length of the nautical mile might be precisely defined.

Following the "Peruvian" expedition of 1735-43, the number of measurements of arcs increased and gradually became more accurate. As the accuracy increased, the ellipticity of the earth was established. The

ments in both feet and meters. The meter was originally (about 1790) intended to be 1/10,000,000 of the distance from the equator to the pole. Since various sizes of the earth were accepted, the length of the meter was not everywhere the same. The value used by Clarke was a composite of the various standards in use at the time, and was defined as 39.370432 inches.

The need for a standard unit of length independent of the size of the earth had been recognized as early as 1827. The British

TABLE I. SIZE AND SHAPE OF THE EARTH

Author	Date	Equatorial Radius (U. S. Feet)	1 Flattening
Commission des Poids et Mesures	1799	20,917,737.03	334.29
Walbeck	1819	20,921,529.68	302.78
Schmidt	1828	20,921,739.65	297.65
Everest	1830	20,922,799.67	300.8017
Bessel	1841	20,923,177.15	299.1528
Clarke	1858	20,926,119.56	294.26
Clarke	1866	20,925,832.16	294.98
Fischer	1868	20,926,263.92	288.50
Clarke	1880	20,925,972.40	293.465
Hayforth	1910	20,926,427.96	297.0
International	1924	20,926,427.96	297.0

principal measurements since about the beginning of the 19th century have resulted in the values shown in Table I. The figures in the last column are determined by the ratio $a/(a-b)$, where a is the equatorial radius and b is the polar radius (not given).

If a standard nautical mile is to be established, based upon one minute of a great circle of the earth, it becomes necessary to decide which dimensions of the earth are to be used. It would seem logical to select the values employed by surveyors and cartographers. Unfortunately, however, several of the "spheroids" of Table I are in use in different parts of the earth. In 1880 the U.S. Coast and Geodetic Survey adopted the Clarke Spheroid of 1856, and since all of North America is mapped on this basis, the choice is not a difficult one for a United States definition.

But this is not the end of the difficulty. In 1866 the values of the units used in the measurements were not well established. Clarke worked in feet and gave his measure-

standard of length is based upon the British Imperial standard yard of 3 feet, the distance at 62°F. between two marks on a bar of bronze kept in the Tower of London. This bar was constructed in 1845.

The International Bureau of Weights and Measures was established in France in 1877. The standard meter established by this body was defined as the distance between two marks on a bar of platinum iridium kept in the vaults of the Bureau.

When the British Imperial standard yard was compared with the standard meter in 1878, the meter was found to be 39.37079 inches. It was compared again in 1898 and the ratio was found to be 39.370113 inches, the value adopted as the legal ratio.

The metric system was legalized in the United States on July 28, 1866, when the length of the meter was defined as 39.37 inches. Since there was no standard U.S. unit of length, this, in effect, defined the U.S. system of length measurements in terms of the meter.

Since the international meter legally equals 39.37 U.S. inches and 39.370113 British inches, the length of the foot is not quite the same in the two countries. The U.S. foot is longer, being equal to 1.00000287 English feet.

In adopting the Clarke spheroid of 1866, the U.S. Coast and Geodetic Survey used Clarke's figures in meters, but considered them to be international meters. Hence, the spheroid used for mapping in the United States has the same ellipticity as the original Clarke spheroid of 1866, but is slightly smaller (about 170 feet in each radius).

is 6080.27 English feet, a value often given in U.S. publications. The value in U.S. feet is 6080.25 U.S. feet, but if the Clarke spheroid is defined in terms of the present relationship of the meter and U.S. yard, the length of the nautical mile is 6080.20 U.S. feet (1853.248 meters) *the official U.S. value.*

The full definition of the official U.S. nautical mile, then, is "the length of a minute of arc of a great circle of a sphere having an area equal to that of the Clarke spheroid of 1866, as defined by the U.S. Coast and Geodetic Survey in 1880."

Neither the United States definition nor

TABLE II. NAUTICAL MILE
Length by various definitions
(U. S. Feet)

	Clarke 1866	International
1' of equator	6087.08	6087.25
1' of latitude at equator	6045.88	6046.33
1' of latitude at poles	6107.78	6107.82
1' of latitude at Lat. 45°	6076.70	6076.94
1' of circle of same length as meridian	6076.76	6077.01
1' on sphere of radius $\frac{1}{2}(a+b)$	6076.76	6077.00
1' on sphere of radius $\frac{1}{3}(2a+b)$	6080.20	6080.42
1' on sphere having a radius equalling the av. rad. of curvature of meridian	6076.76	6077.01
1' on sphere the area of a great circle of which equals the area of the plane of the meridian	6076.75	6076.99
1' on sphere the volume of which equals the volume of the earth	6080.19	6080.41
1' on sphere the surface of which equals the surface of the earth	6080.20	6080.42
1' on sphere having a great circle 40,000,000 meters long	6075.62	
Value recommended by Directing Com. of IHB (1929)	6076.10	

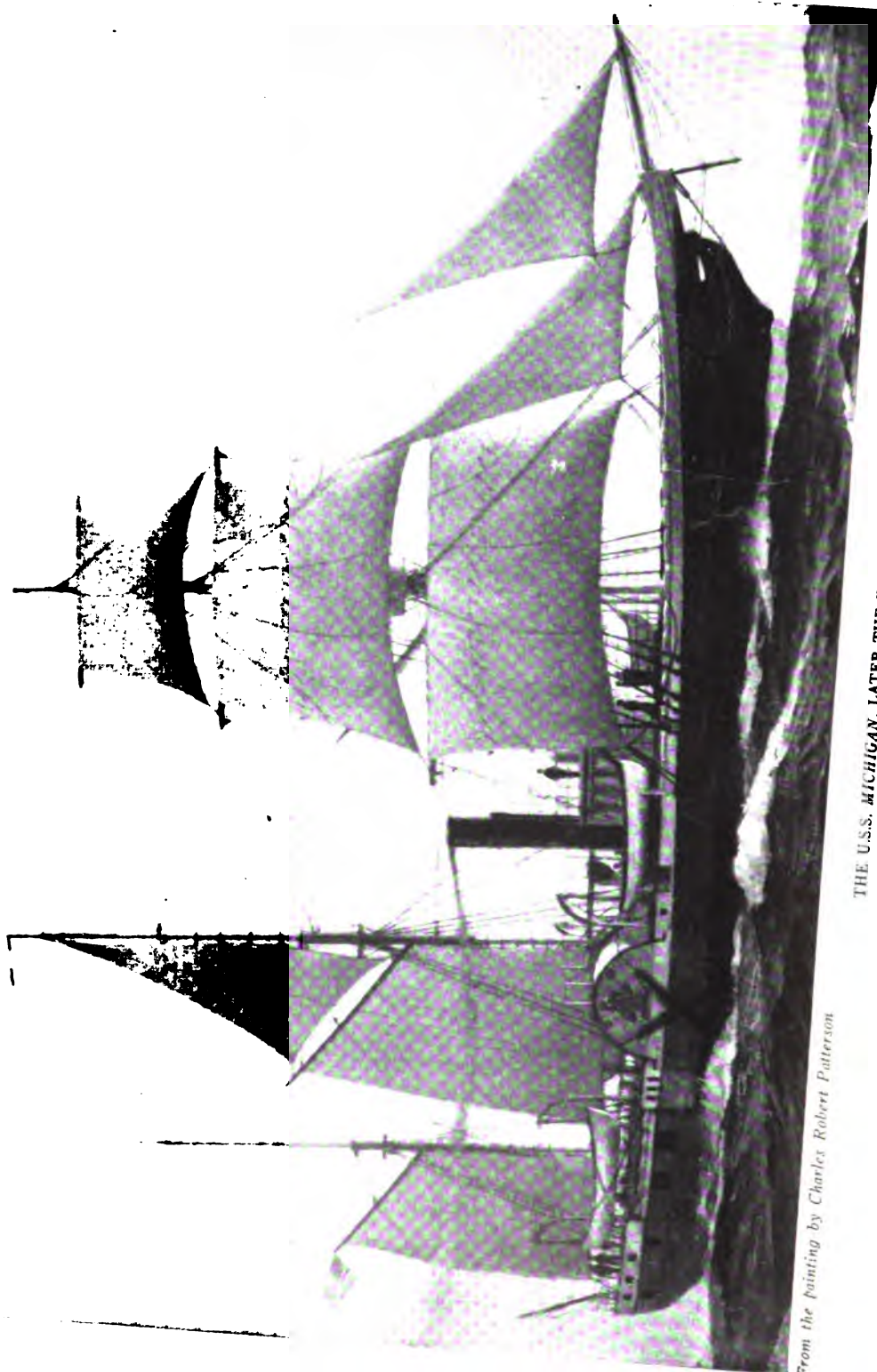
DEFINING THE LENGTH OF THE NAUTICAL MILE

Having selected the figure of the earth upon which to base our standard nautical mile, it becomes necessary to define *which* great circle shall be used. Various definitions have been suggested, as shown in Table II, which give values for both the Clarke spheroid of 1866 and the International ellipsoid.

Again it is a matter of definition. In the United States the official value is that of one minute of arc of a great circle of a sphere having an area equal to that of the earth. If this is computed using the Clarke spheroid of 1866 in terms of Clarke's dimensions in English feet, the length of the nautical mile

the U.S. standard length is universally accepted. Some of the values used in various countries as follows:

Belgium	6082.66
Denmark	6075.81 (official)
Finland	6076.10
France	6076.10
Germany	6076.10
Great Britain	6079.98 (6080.00 British Feet)
Greece	6076.10
Iceland	6085.95
Italy	6075.61
Norway	6076.10
Portugal	6075.45
Spain	6075.45
Sweden	6076.10
United States	6080.20



THE U.S.S. MICHIGAN, LATER THE WOLVERINE
Launched in 1843, the *Michigan* confined her cruising to the Great Lakes,
and was long a "desired" ship by young junior officers.

From the painting by Charles Robert Patterson

OUR FIRST IRON MAN-OF-WAR

By CAPTAIN FREDERICK L. OLIVER, *United States Navy (Retired)*

WHAT is probably the oldest iron ship in the world today, and one of the first iron men-of-war built, is approaching the end of a career that exceeds the century mark by a few years.

In 1841 Congress authorized the construction of a side-wheel steam man-of-war for use on the Upper Lakes, to match the British naval strength in those waters.

The use of iron in shipbuilding at that time was a subject as contentious as the adoption of steam propulsion and the propeller proved to be in subsequent years.

In England the dwindling supply of ship timber had promoted the matter of iron shipping, but in the United States a contrary thought prevailed, and it was not until about the time of the Civil War that the Navy really turned to iron ships.

No record is available of the influence which brought about the adoption of iron for the ship built at Erie, and the construction at Pittsburgh shortly thereafter of a second ship from the same material; but log-rolling was as prevalent then as now, and Pennsylvania politicians probably supplied the incentive.

The construction at Erie of the U.S.S. *Michigan* involved difficulties quite comparable in some respects to those which beset Oliver Hazard Perry's shipbuilding efforts at the same port some 30 years previously.

Practically nothing was known at that time in this country about designing an iron ship, or the technique of fabricating the unfamiliar material. Nor were other than the most primitive construction facilities available at Erie.

As a result, the lines adopted for the *Michigan* were those of the sailing ship of the period, and the frame was designed to afford the requisite structural strength without recourse to the strength available in the hull plating, providing a hull so strong that, despite years of abuse, it is structurally sound today.

I-beams being unknown at the time, the ribs were made from T-bars, and the longitudinals were built-up box structures about 12 inches by 24 inches in cross section. In all there were five longitudinals, the keel being the only one projecting beyond the skin of the ship. Three of the longitudinals ran the full length of the ship and two were beneath the machinery spaces. The hull plates were all shaped by hand, and the rivet holes were punched by the same means.

The hull material was wrought iron made by the charcoal process in Pittsburgh and carted to Erie. The purity of this material is attested by the fact that the metal is still in excellent condition.

It is related that many citizens of Erie considered an iron ship an anachronism, consequently throngs were in attendance on the afternoon of December 5, 1843, to witness the launching and satisfy their curiosity about the ability of the ship to float.

All they saw was a ship that stuck on the ways and could not be persuaded to move. Strange to say, during the night the ship relented of its perversity and was found afloat at daybreak the following day, having launched itself.

The *Michigan* cost only \$165,000, displaces 685 tons, has a length of 165 feet, a beam of 27 feet, and draws 9 feet. The original two-cylinder direct-acting condensing engine, which develops 170 horsepower, still remains in the ship. It has a bedplate that is a cast iron slab 22 feet long, 2 feet wide,

A GRADUATE of the Naval Academy in 1901, Captain Oliver served afloat and ashore for 35 years before his retirement in 1936. He has contributed numerous articles to the *Proceedings*. He writes that he is indebted for much of the data in this article to Mr. Herbert Reynolds Spencer of Erie, Pennsylvania, who permitted use of material from his brochure, "The Iron Steamer."

and 2 inches thick which carries the two 36-inch by 8-foot cylinders. The engine is secured to 14-inch timbers that are inclined at an angle of $22\frac{1}{2}$ degrees. Transporting the heavy bedplate 130 miles from Pittsburgh over the roads of that day must have presented a problem to the teamsters.

It is variously reported that the two original boilers were made of copper, the customary material for boilers used at sea at that time, or of iron with brass tubes, which seems an unusual combination for use even in fresh water.

In any event, in 1861 the first set of boilers was replaced by a pair of iron boilers that lasted until 1892, when the present set was installed. The long lives of the several pairs of boilers can be attributed to their not having been exposed to the consequences attending use in salt water, and to their having been operated under a maximum pressure of but $18\frac{1}{2}$ pounds of steam.

The *Michigan* was fitted with pipes that carried live steam around the upper decks, to be used in repelling boarders, an innovation that was widely copied until boarders went out of style.

Originally rigged as a bark, a change was later made to a barkentine rig, doubtless because smoke and embers from the smoke-stack made square sails on the mainmast an impossibility. It is to be noted that the *Michigan* differed from practically all men-of-war of its day in that it was a steamer with auxiliary sail power and not a sailing ship with an auxiliary steam installation. Nevertheless, prior to 1900 the *Michigan* seldom failed to spread its canvas to a favoring breeze, the personnel of that era being well accustomed to the use of sail.

The designed battery of twelve 32-pound carronades and two Paixham 8-inch pivot guns occasioned a diplomatic protest from the British Minister in Washington before the *Michigan* sailed on its first cruise.

In 1817, a more or less informal agreement was reached between the United States and Great Britain which limited each of their naval strengths on the Upper Lakes to two ships not exceeding 100 tons burden, and armed with not more than one 18-pounder each.

During the succeeding 20 years there was

no occasion to breach the so-called "Gentlemen's Agreement", but then came a period of unrest in Canada, at that time a British colony with a mediocre administration. Radicalism in Canada became rife and sought assistance from similar elements in the United States, resulting in several provocative raids on Canadian territory by groups organized in the United States.

The British began a patrol of ships equipped to cope with raids which the United States should have nipped in the bud, tongues wagged, the Eagle screamed, and the construction of the *Michigan* was authorized.

With the protest from the British Minister came a return to reason, and an agreement was made which disregarded the *Michigan's* excess tonnage, but not its armament.

So the newly commissioned Side Wheel Bark *Michigan*, our first iron man-of-war and the pride of the Navy, hoisted out its battery of shiny brass guns and sailed on its maiden voyage armed with a lone 18-pounder.

Subsequent to the Civil War, the matter of the armament of the *Michigan* seems to have occasioned no comment, and various types and calibers of guns came and went, eventually winding up with an installation of two 3-pounders, either of which, however, was more than a match for the original 18-pounder.

For nearly 80 years this ship with its complement of 10 officers and 87 men sailed the Upper Lakes, never firing a gun in anger, and promoting good feeling and understanding between two friendly peoples whose 3000 miles of boundary have gone unfortified for generations.

The *Michigan's* paddle-wheels, churning the water at $18\frac{1}{2}$ turns a minute, gave the ship a speed of 8 knots. When sailing full and by, an additional two knots could be counted on. At this speed summer cruises to ports on both sides of the Lakes were enjoyable events confined largely to showing the flag, a bit of hydrographic surveying now and then, and some training and recruiting duties.

Come November, the ship repaired to Erie and secured to a pier. Topmasts were struck; and with the upper deck housed in, the officers and crew were ready for a winter

in a hospitable community where the ship became accepted as an institution.

Many members of the crew served in the *Michigan* for years, little attention being given to rotation of duty in the case of enlisted men until around 30 years ago.

Officers, particularly the younger ones, sought duty in the *Michigan* for several reasons.

For many years prior to 1899, it was not unusual for an ensign to remain in that grade for 10 or more years. At sea he received \$1200 a year for the first five years, and \$1400 thereafter. Ashore his pay was \$1000 and \$1200 for like years of service, and there was no allowance for quarters. Consequently ensigns found it difficult to exist ashore unless they were assigned government quarters, which were scarce and hard to come by.

So it was no wonder that young officers pulled all sorts of wires to obtain orders to the *Michigan* where a berth in the wardroom was assured, and the assignment provided most of the advantages of shore duty with the retention of sea pay.

Proximity brought results that so often follow in its wake, and many Erie maidens married into the Navy. In fact the trend at one time was so pronounced that Erie could seriously challenge Norfolk's title of "Mother-in-Law of the Navy."

But time in its passage changes many things and the *Michigan* in this respect proved to be no exception. In 1905 its name was changed to *Wolverine* to make the original name available for a new battleship.

By 1910 the Navy had grown tremendously and was so short of officers that a passed midshipman with a permanent assignment to watch and division duty was no novelty. And the Navy pay schedule at last had made provision for a commutation of quarters allowance on shore duty when public quarters were not available, although a 10 per cent increase in pay for sea duty was in effect.

As the result of these changes, duty in the *Wolverine* became undesirable, and there was no regret when the ship was assigned to the Pennsylvania Naval Militia in 1910.

Under Naval Militia and, later on, Naval Reserve auspices, the *Wolverine* continued its placid existence—Erie in winter and

cruises in summer—until the summer of 1923 when, while on a cruise, a tired connecting rod let go and the piston knocked the cylinder head out.

The ship was towed to Erie and then began a determined effort to have repairs effected by the Navy. But the Navy was adamant in its refusal. Pacifism was at its height in Congress at that time, and the Navy did not have sufficient funds to keep its fighting ships in repair, much less spare money for the needs of the *Wolverine*.

In 1927 the ship was loaned to the City of Erie, the City assuming the cost of upkeep. But again time brought changes. People lost interest in the ship, and eventually the *Wolverine* became a half sunken derelict in the harbor at Erie.

The crowning indignity came in January, 1943, when the ship was left nameless through transference of its name to an aircraft carrier.

For some years the needs of the old ship have engaged the attention of The Foundation for the Preservation of the U.S.S. *Michigan*, an incorporation of Pennsylvanians interested in conserving our first iron man-of-war.

Recently the Executive Committee of the Foundation reluctantly came to the conclusion that since there seems no possibility of securing Federal funds for the purpose, it is inadvisable to attempt to raise by subscription the \$350,000 estimated necessary for the restoration of the ship to its original condition, and in addition, funds for its annual maintenance.

Two plans for the ultimate disposal of the ship are now under consideration by the Foundation:

- (1) Sink the ship in deep water, with appropriate ceremonies.

- (2) Cut off the bowsprit, stem, and a few feet of the hull, and erect the assembly on shore as a permanent memorial, the remainder of the ship to be scrapped.

Adoption of either plan will spell the end of an interesting ship that has ploughed the waters of friendship, ridden at anchor in ports of confidence and trust, and which was long a symbol of mutual good-will between neighboring countries who have found it possible to live in peace with each other.



THE FLAG COMES DOWN IN THE PHILIPPINES

Triumphant Japanese lowering the Stars and Stripes after the surrender.
Picture reproduced from a Japanese "victory" book published in 1942.

EARLY JAPANESE IMPERIALISM AND THE PHILIPPINES

By JAMES K. EYRE, JR.

ONE DAY during the first week of February, 1942, the gallant American and Filipino forces defending Bataan took advantage of a lull in the fighting, and in the absence of better entertainment, listened to the Japanese-controlled radio station at Manila. The program contained intermittent bursts of Japanese propaganda, with the invaders being quite verbose concerning their claims of victory in the Philippines and elsewhere. At one point, the announcer suddenly interrupted a presentation of musical recordings, and the weary soldiers sensed that they were about to hear a pronouncement of unusual significance. They did not have to wait long before their impression was substantiated. An aged but firm Filipino voice began to make an appeal for the immediate surrender of the beleaguered United States troops hemmed in on the small peninsula, with their backs to the sea.

The speaker was General Emilio Aguinaldo, universally regarded as one of the most colorful personalities in Filipino history. Well beyond his prime, the old *insurrecto* had been a motivating figure in the native revolt which originally flared up against the Spaniards in 1896, and though temporarily checked, broke out with increased fury against American authority shortly after Spain ceded the Philippines to the United States. Both the Spaniards and the Americans initially underestimated the military resourcefulness of the natives. The number of Spanish troops in the Philippines rose from 1,500 in August, 1896, which was fifty per cent greater than the normal garrison, to an army of 28,000 during the following year, when the main center of Filipino resistance collapsed. More troops had been asked for, but the conflagration in Cuba kept to a minimum the reinforcements sent to the Far East.

The subsequent resurgence of the Filipino

revolutionary movement resulted in fiercely fought battles with the American expeditionary force, and it was necessary for the United States to make a major effort before peace was restored throughout the colonial possession. On April 1, 1898, the regular army of the United States included 28,183 officers and enlisted men; by contrast, a total of 126,468 troops, or more than four times that number, traversed the Pacific to the Philippines and participated in the campaign to crush Aguinaldo and his followers. The Filipinos offered tenacious resistance, and even after the central power of the Revolutionary Government had been broken they resorted to harassing guerilla warfare on Luzon and several other islands of the archipelago.

It is needless to say that Aguinaldo's plea for the capitulation of the Bataan forces received an unenthusiastic response. By some, he was accused of being a Japanese pawn; others, looking at the situation more cautiously, believed that the invaders had compelled him to make the radio address. Whatever the truth may have been with reference to this matter, the unusual speech made one think of events of more than forty years ago, when Aguinaldo and his supporters challenged the military might of the United States. The Tagalog's address from Manila was given on a date closely approximating the forty-third anniversary of the opening clash between Americans and Filipinos on February 4, 1899. At that time, Aguinaldo,

A LONG-TIME student of naval and maritime affairs, especially in connection with the Pacific and the Japanese, Mr. Eyre for some time served as Special Assistant to President Sergio Osmena of the Philippines. He is the author of more than a dozen previous articles in the PROCEEDINGS.

as a youthful but preeminent native officer, welcomed the test of strength on the battlefield, because he had been in the forefront of those advocating an open break with the armed forces of the United States. More than four decades later, his role was reversed; instead of admonishing his countrymen to resist the foreign invaders, he asked them to lay down their arms and to accept the Japanese as their liberators.

It is generally accepted knowledge that, beginning with the Spanish-American War, the Japanese enjoyed an ever-increasing influence in the Philippines, culminating in their invasion and conquest of that insular country while it was still protected by the flag of the United States. The presence of Japan as a factor in Filipino affairs is not restricted to the period of American sovereignty, however. Japan being an insular country, her inhabitants responded to the attraction of the sea, and in their conception of water-borne commerce, a logical route lay to the southward, where the Philippines constituted the first great archipelago encountered when sailing from the Japanese mainland in that direction. In view of this geographical pattern, Japanese seafarers probably touched at the Philippines as far back as the dawn of the Christian era. Beginning with the twelfth and thirteenth centuries a flourishing exchange of goods materialized between the two countries. Long before Magellan explored the Western Pacific, Japanese traders were making excursions to the coasts of the Philippines, where they gave cloth, arms, and trifles of various sorts for gold which the natives brought from the mountains.

Perhaps the most significant aspect of Japanese-Philippine relations during the seventy-five years (1565-1640), which began with Spain's appearance in the Far East colony and ended with Japan's adoption of isolation, pertained to various attempts by the rulers of the northern kingdom to gain control of the rich archipelago. Late in the sixteenth century, the great Japanese shogun, Hideyoshi Toyotomi, endeavored to seize the Spanish possession. In addition to the Philippines, he aspired to conquer a vast area, including Formosa, China, and India, but his widespread intrigues, although com-

prising an interesting chapter in the history of Japan, did not produce the desired results. During the first part of the next century, other Japanese entertained similar ambitions. One adventurer, Sigemasa Matsukura, petitioned the Tokugawa Government to allow him to prepare an expedition for an invasion of the Philippines. The necessary permission was granted, but he died in 1630 before he could carry out the pretentious plan.

It is entirely possible that only Japan's abrupt termination of relations with the outside world prevented the renewal, and perhaps successful execution, of her smoldering yearning to acquire Formosa, the Philippines, and other outlying countries. As it was, the Japanese were confronted by unfavorable circumstances when some of their number revived previous dreams of empire during the decades immediately following the abandonment of isolation in 1853. Japan's renewal of intercourse with the rest of the world coincided with an intensification of effort by the western nations in East Asia. Being unable to challenge the intruders, the Japanese applied themselves industriously to national rehabilitation. In the decades which followed, the rapid "modernization" of the erstwhile hermit kingdom, including the establishment of a westernized army and navy, was regarded by foreign observers as one of the most remarkable developments of modern history. It was not until Japan's crushing defeat of China in 1894-1895, however, that widespread concern appeared abroad regarding the apparent intent of the small insular country to embark upon a far-reaching policy of overseas expansion.

Although Japan's imperialism was not sufficiently far-advanced by the end of the first Sino-Japanese War to enable foreign observers to make a detailed analysis of its ultimate goals, in some quarters the feeling already prevailed, though vaguely conceived, that the rising Asiatic power, aside from its continental ambitions, intended to obtain a number of insular colonies in the Pacific Ocean, of which Formosa was to be the first. It is related that one of the first appraisals of this kind was made by President Ulysses S. Grant, who, after returning from a voyage to the Far East, declared that Japan was

destined to rule the Philippines. Shortly after the Battle of Manila Bay, a similar reaction was voiced by Admiral George Dewey, who apparently chose to ignore the contingency that Spain might be supplanted by the United States in the Philippines. Dewey, as a naval officer, sensed that Japan's increasing strength at sea foreshadowed an acceleration—but not immediately—of her territorial expansion in the South Pacific. John Barrett, former American Minister to Siam, and present with the Admiral on the *Olympia* as an observer subsequent to the famous naval action of May 1, 1898, recorded the other's prophecy as follows:

I look forward some 40 or 50 years and forsee a Japanese naval squadron entering this harbor, as I have just done, and demanding surrender of Manila and the Philippines, with the plan of making these islands a part of the great Pacific Japanese empire of the future.

I will not live to witness what you will see if you live your ordinary life. That will be the conquest of China by Japan, and when that is done, conquest of all island possessions from north to south off the Pacific coast of the Far East.

Notwithstanding this speculation about the possibility that some day the Philippines would pass into the hands of Japan, the latter's reestablishment of intercourse with foreign lands brought her into friendly contact with the Spanish colony, and the Japanese, in a normal and orderly fashion, took the initiative in fostering the growth of trade with the Filipino people. A Japanese consulate was established at Manila in 1888, to be closed in 1893, and reopened in 1896. This renewal of economic and political relations between Japan and the Philippines had another effect. Like the occasional neutral observer who felt that the Japanese planned to expand southward, the Spanish colonial authorities soon manifested uneasiness over Japan's intentions in that region. The Europeans noticed that Japan's official encouragement of trade with the Philippines occurred almost simultaneously with the recall of her military forces from Formosa, and when an Imperial Trade Commission arrived at Manila in 1875, it was received with marked coolness.

The unexpected strength displayed by Japan in the war with China heightened

Spain's concern about the security of the Philippines. Sensational rumors made their appearance regarding alleged Japanese intrigues and plots to gain control of the rich archipelago. In 1895, a widely circulated news story excited Spanish government circles. The account in question, appearing in the *Correo Español* as a letter from a correspondent at Manila, and dated January 23, 1895, stated that "news had been received from Hongkong that the Japanese expect to come and take possession of these Islands." It then continued to tell of a Japanese spy who went to the Philippines to secure information which would be of assistance to the northern kingdom in some surprise assault upon the colonial possession.

Adding further fuel to the fire, some selections of the Japanese press, carried away by the smashing victories of their country in the armed struggle with the Chinese giant, began to make disparaging remarks about the shortcomings of Spanish rule in the Philippines. Responding to this hostile attitude, newspapers in Spain and the Philippines countered with adverse criticism of the Asiatic nation. Genuinely worried about the implications of Japan's newly recognized position in Far Eastern affairs, a false braggadocio was assumed by Spanish commentators and writers. Their chief theme embraced the theory that Japan, though able to master the decrepit Chinese, was no match on the battlefield for any of the ranking western powers. A typical analysis of this kind was that by Jenaro Alas, a well-known Spanish expert on military affairs, who asserted, "I do not imagine that it has occurred to the imagination of any Japanese, even the best-varnished (with civilization), to try to expel from Asia and Oceania the whites, who are meat-eaters. However vain they may be, they will comprehend the difference there is between race and race, or perhaps species and species. It is one thing to scratch the coasts of China, and another to invade inland territory where there are Englishmen, Frenchmen, Russians, or Spaniards."

Responsible Spanish statesmen, speaking fundamentally from a political point of view, entered the discussion in a more dignified vein. Señor Dupuy de Lôme, the veteran of some diplomatic service in the Far East, and

who later became involved in an embarrassing fiasco at Washington and was declared *persona non grata* by the United States Government, urged caution and restraint in evaluating the future course of Japanese policy. In a book devoted to an analysis of Far Eastern affairs, he counseled the arrangement of a friendly understanding with Japan, for in his judgment the latter nation would continue to play an even more influential role in world politics. Writing in February, 1895, Señor Segismundo Moret y Prendergast, former Spanish Minister of State and a leading authority upon colonial problems, examined in detail the various aspects of Japanese-Philippine relations. It was his impression that the rise of Japan to the position of a first-class power implied "a radical transformation in the relations of Europe with the Orient, and especially with the possessions of Spain in those seas." In a word of warning, he added, "To refuse to recognize this fact, waiting for events which will not delay in coming, would be equivalent to a man sleeping on the rails of a railroad track, confident that the vibrations of those rails produced by the oncoming train will warn him of the danger." Outlining what he considered to be a sound procedure for the protection of Spain's interests in the Philippines, Moret asserted that "the Japanese are a coldblooded people; they are intelligent and good observers; the way in which we can influence them is by demonstrating that we are aware of our position and our destinies. . . ."

From almost every point of view, the Spaniards were not in a position to defend the Philippines against Japan or any strong military power. It had become a fixed practice for the Government at Madrid to maintain not more than one thousand Spanish troops throughout the entire insular territory. This small force, being inadequate to effect public order and to safeguard Spanish sovereignty, was necessarily supplemented by larger numbers of native militia which had been drafted into military service. When the Filipino revolt broke out in August, 1896, 700 of the 1,500 European troops dispersed throughout the colony were in Manila. The garrison at the latter point consisted of 300 peninsular artillery, the remainder being

principally marine infantry and detachments of sailors from the Spanish naval squadron anchored off Cavite. There were about 2,000 native auxiliaries of all kinds stationed at the capital, and 4,000 others in the provinces.

These troops, in numbers alone, were inadequate for a vigorous defense of the Spanish possession. The problem was made much worse when the mounting discontent among the Filipino populace spread to the native soldiers, which normally comprised about seventy-five percent of all of the armed forces in the colony. From the very beginning, the Spaniards had employed native militia to suppress internal disorders and to repel attacks from the outside. Once Spain lost the loyalty of the Filipinos in military service, their control of the archipelago would become considerably weakened. The degree of disaffection existing among the colonial troops was demonstrated by the half-hearted attitude or outright desertion of many of them during the rebellion of 1896-1897 and its resurgence in 1898. In the latter case, the wholesale desertion from Spanish ranks by the Filipino militiamen and their co-operation with the Americans hastened the downfall of Spanish sovereignty in the Philippines. There is no reason to believe that a parallel development would not have taken place in the event of a war between Spain and Japan.

The physical defenses of the Philippines had undergone a similar change for the worse. The fortifications guarding Manila and other key points in the archipelago were antiquated and weakened by neglect. A vivid picture of the situation, as it existed in 1896, was given by General Francisco Borrero, formerly a high-ranking military official in the Philippines:

Manila is at the mercy of any fleet. There is not a single gun at the Corregidor Island, which should be the key to the harbor. For all defense the capital city has four modern cannon, thirty mortars and 100 old cannon. At Cottabatto there is one modern cannon and several old ones that are totally useless. There are also some old battle pieces, the carriages of which are broken. At Sooloo we have only four modern guns. At Cavite there are but five iron guns, each worse than the other. There are no gunpowder supplies. At Zamboanga we have eight guns and four at Panay-Panay. The military warehouses are totally empty.

This deterioration of the permanent land defenses, in addition to having been caused by the generally decadent state of Spain's colonial administration, also stemmed from the fact that the Philippines had not been directly involved in an international conflict since the British captured, and later evacuated, Manila in 1762. At sea, Spain's defence forces were in little better shape than those ashore. This was important, for in a war with Japan, like that with the United States, Spain's retention or loss of the Philippines would have been determined primarily by naval battles. Japan's attitude for mastering the fundamentals of sea warfare was indicated by the outcome of the armed struggle with China. On the other hand, Spain, once the mistress of the world's oceans, defended her Far Eastern colonies with an inadequate naval force. Her warships were outmoded and illkept, and the naval station at Cavite had fallen into disrepair.

Cavite originally was designated as the principal Spanish base in the Philippines during 1795, when the British seemed to be on the verge of attempting a reoccupation of the country. One hundred years later, with the prospect of serious friction with the Japanese looming large in the minds of the Spaniards, consideration was given to the long-standing problems of erecting a modern naval base in the Philippines and of providing formidable shore fortifications to protect Manila and the other strategic areas in the colony. Realizing the need for prompt action, Spanish naval engineers had proposed a plan whereby Olongapo, fifty miles north of Manila on Subic Bay, was to be the site of the main Philippine base, with Cavite relegated to a secondary position. Despite their constant agitation for a more vigorous policy previously, the proponents of this plan were given little encouragement by the apathetic government authorities. These naval engineers understood that Spain, as in the case of the United States which succeeded her, needed a major Philippine base before effective defensive operations could be carried out against an enemy in that sector. The lack of facilities for the repairing and servicing of a fleet was especially bad, and the Philippines possessed no dock capable of

accommodating vessels of over one thousand tons.

The increasing fear of Japan and the strained relations with the United States caused the Spaniards to cast aside much of their former indifference, and preliminary work, including the construction of buildings at Olongapo, had been accomplished prior to the outbreak of the Spanish American War. The triumphant Americans likewise designated the Subic Bay site as the most favorable location for the principal base of the United States Fleet in the Far East. Reverting to the precedent established by the Spaniards, the American Government followed a course of indecision, and grandiose plans for the development of Olongapo were subsequently abandoned. This failure to build a major base in the Philippines imposed a severe handicap upon the United States when Japan launched her treacherous attack in 1941. The Japanese, for their part, constructed great naval and military establishments in Formosa and the Pescadores which served them well in the conduct of their offensive operations.

The demoralized condition of the Philippine defenses was strikingly illustrated by the ease with which Admiral George Dewey, U. S. Navy, won the Battle of Manila Bay on May 1, 1898. Besides the absence of sufficient preparation, the Spaniards, by not taking advantage of certain factors which tended to favor them, were unable to coordinate the determined use of shore batteries, the mining of adjacent waters, and the strategic deployment of their available naval power into a single, effective plan of defense. Naval annals have rarely recorded such a one-sided victory as scored by the Americans. Whereas the Spanish fleet was virtually annihilated, the warships under Dewey's command were hardly touched by enemy fire, with none of the American sailors killed and but eight wounded.

It probably has not been generally realized that the Filipino rebellion of 1896-1897 profoundly affected the course of American action in the Philippines subsequent to May 1, 1898. If, after winning the memorable naval engagement, Dewey had been confronted with the normal garrison of Spaniards at Manila, ranging from 500 to 700 soldiers,

his strength as compared to that of the defending forces would have permitted him, without further delay, to attempt a storming of the capital with Marines and sailors; and if he had captured this key city, which was entirely possible, the entire Philippine Archipelago, for all practical purposes, might have passed quickly under American control. Had this happened, undoubtedly there also would have been deep repercussions with reference to the role of the natives in ensuing events, but whether this change would have worked to the benefit of the United States, one can not say.

If the Japanese, instead of ourselves, had fought with Spain during this period, their task of occupying the Philippines would have been a simpler undertaking. With bases in Japan proper only about one-sixth the distance from the Philippines as those of the United States, the Japanese would have been in a position to concentrate a greater preponderance of naval strength against the Spaniards than Dewey was able to do. Similarly, the question of expediting reinforcements to follow up the initial blows at sea would have been solved more easily by the Asiatic nation, especially when supplies and men could be transported from nearby Formosa to the Spanish colony within twenty-four hours. However numerous the armed forces of Spain might have been at Manila and in the provinces, a Japanese invasion thrust would have enjoyed great chances of success.

In view of these facts, one can understand why the Spaniards were disturbed about the future of the Philippines, particularly with respect to Japan. Spanish disquietude reached a high point when the Japanese, as a sequel to their overwhelming defeat of the Chinese, acquired Formosa and the Pescadores. The vulnerability of the Philippines to attack was reemphasized to the worried Spaniards. This was not the first time that the occupation of Formosa by a potential antagonist had troubled Spain. In the seventeenth century, the notorious Chinese pirate, Koxinga, made his headquarters there and threatened to overwhelm the defenders of the Philippines. Spain's strategic problem in her Far Eastern colony, to be inherited by the United States, was how to cope effectively

with a strong sea power which had occupied a nearby territory.

An acceleration of the rather feeble and obviously belated efforts of the Spaniards to strengthen Philippine defenses was not the sole effect of Japan's acquisition of Formosa. Feeling uneasy about the Japanese advance southward, the Madrid Government decided to sound out Toyko with respect to Japan's official attitude toward Spain's colonies in the Far East. Besides the larger issues under consideration, there was the specific problem of determining the territorial limits of Formosa. The Spaniards, although previously aware of Formosa's strategic location, apparently had never bothered to determine the line of demarcation between Formosan and Philippine territory. The appearance of aggressive Japan in the former Chinese possession forced the Madrid Government to weigh this question.

It is not unnatural that the factor of geographical propinquity exerted a strong influence in Spain's urgent desire to arrive at a peaceful accord with Japan regarding the latter's southern policy. The proximity of Formosan territory to a number of small islands of the Philippine Archipelago extending above Luzon is probably not fully realized in the United States. The northernmost piece of land in the Philippines, the islet of Y'Ami, is 88 miles southeast of the Japanese possession. Y'Ami is 43 miles north of Basco, the capital of the Batan Islands, one of the two principal insular groups between Japanese territorial waters and Luzon. Basco possesses a fairly good anchorage, and the United States Navy subsequently maintained a cruising station there for a number of years. Some 100 miles farther south lies the island of Camiguin in the Bubayan group, which is roughly 50 miles northeast of the port of Appari, a point of landing for the Japanese invasion forces during December, 1941.

The resulting international agreement which Spain negotiated with Japan, and the diplomatic negotiations preceding it, comprise a chapter of some importance in the history of the Far East which has been generally overlooked by American students of foreign affairs. The entire incident is closely associated with the better-known

intervention of France, Germany, and Russia in the peace settlement of the Sino-Japanese War. The treaty of Shimoneseiki, concluded on April 17, 1895, besides awarding Japan the southern islands, presented her with the Liaotung Peninsula in Manchuria. The three European powers, seeking to prevent the Japanese from obtaining a *point d'appui* on the Chinese mainland, urged the Tokyo Government to renounce the possession of the peninsular territory. Since Japan was not strong enough to contest the combined wills of these powers, she acquiesced to their wishes and grudgingly returned the disputed land to China in a subsequent action of November 8.

Spain, though not participating in the joint representations made to Tokyo, took advantage of Japan's dilemma and pressed her own demands regarding the clarification of Spanish-Japanese relations. The western powers which instigated the Liaotung controversy took an interest in strategically-located Formosa as well. Although there is a dearth of information on this subject, they seem to have queried Tokyo about the new possessions in the south, and consequently the channel between Formosa and the Chinese Coast (The Channel of Formosa) was declared internationalized and open to commerce of all nations. Moreover, Japan allegedly promised that neither Formosa nor the Pescadores would be ceded to any other power.

Before commencing negotiations with the Japanese, the Madrid Government first sought assistance from the more influential countries of Europe. Great Britain was disregarded by the Spaniards in this instance, for the British had revealed their position with reference to the Japanese by refusing to participate in the Liaotung affair. The groundwork for the creation of the Anglo-Japanese Alliance in 1902 was already apparent. The attitude of Imperial Germany was disappointing to the Iberian kingdom. The Berlin Government, perhaps remembering the dispute with Spain over the Caroline Islands in 1885-1886, remained cool to the other's proposals. In contrast to the negative reaction of Germany, Czarist Russia, which was eager to check Japanese influence in any part of the Far East, and especially France,

whose security in Indo-China would have been threatened by a further extension of Japanese influence in a southern direction, lent their active support to the plans of Spain. With this strong backing, Spain secured a favorable response from Japan, and on August 7, 1895, a treaty was signed at Tokyo by the accredited representatives of the two nations. This was a favorable time for the Spaniards to press their case, because the Tokyo Government was in the midst of debating the advisability of acquiescing to the western powers with regard to the Liaotung Peninsula, and it was not until three months afterward that the formal reversion of the disputed territory was agreed to.

In considering the evolution of Japan's relations with the Philippines, the Spanish-Japanese agreement of August 7, 1895 was brief and to the point. Don José de la Rica y Calvo, the Spanish Minister at Tokyo, represented his government in the negotiations and signed the completed document. Marquis (later Prince) Saionji, Minister of Public Instruction and Minister of Foreign Affairs *ad interim* in the Japanese Government, who subsequently gained renown as an elder statesman, or *genro*, served his country in a like capacity. In the opening statement of the treaty, it was asserted that Japan and Spain, in the spirit of the good relations existing between them, wished to determine their respective territorial rights in the western Pacific. It was decided by the two contracting parties that the degree of latitude which passes through the middle of the Channel of Bachi comprised the boundary line between Japanese and Spanish territory. Japan also announced that she did not have any claims upon the islands to the south and southeast of this line. Spain made a similar assertion concerning the islands to the north and northeast. Obviously the territories most affected by these statements were Formosa and the Philippines.

Not many months passed before the Philippines witnessed the outbreak of the rebellion which brought Emilio Aguinaldo into the limelight as a Filipino leader. This uprising, more fierce and widespread than those of the past, severely tested Spanish sovereignty in the archipelago. It was widely circulated throughout the Islands that Japan

intended to intervene in behalf of the insurgents. Spanish newspapers and books which discussed the insurrection dwelt extensively on the alleged efforts of Japan to aid the natives in their struggle. According to some sources, the Filipino society called the *Katipunan*, which led the revolt of 1896, had sought to purchase arms and ammunition from Japan during the previous year. Captured documents of the Tagalog revolutionists seemed to indicate that the *Katipunan* had appointed a special committee to carry on the necessary negotiations with the Japanese at Tokyo.

That the Spaniards were concerned over the possibility of Japan lending armed assistance to Aguinaldo and his associates was demonstrated by the details of an alleged incident which circulated within official circles at Manila. During the first part of February, 1896, a Japanese cruiser arrived at the Philippine capital on a courtesy visit. The *Katipunan* apparently decided to take advantage of this opportunity and sent representatives to make an effort to confer with the officers of the vessel. It was claimed that this delegation met and talked with an Admiral Hirawa and a fellow officer. According to reliable sources, an agreement was negotiated between the Japanese Consul-General, on the one hand, and the *Katipunan*, on the other. It was agreed that the Filipinos were to pay one million two hundred thousand pesos in eight installments for a large quantity of arms and ammunition. This plan was said to have failed because the *Katipunan* was not able to raise the necessary sum of money before its activities were discovered and curtailed by the Spanish officials.

Although some impartial observers tended to discredit this story at the time, official documents of the Spanish Government tended to substantiate it. The Governor-General of the Philippines, writing on September 20, 1896, to Marquis de la Barrera, Spain's Minister to Japan, stated, "I have no doubt that the Japanese Government is exerting effort to show good will toward our Government, but I note something strange which induces me not to confide absolutely in the promises of Japanese officials nor to act in accordance therewith. The coming to

Manila of a Japanese Viscount, the son of an Admiral, under the pretext of business, who conferred secretly with the most prominent Filipino agitators, makes me presume that, even if I am not aware of an agreement which might have been concluded between them, at least an understanding was established which may be dangerous in the future."

Spain's colonial authorities also regarded with suspicion the presence of certain Filipinos at Tokyo and Yokohama, who since 1892 had sought to enlist the aid of the Japanese in the struggle against their western rulers. This small group of Filipino expatriates was augmented early in 1896 by the arrival of several representatives of Aguinaldo who were entrusted with the special mission of soliciting help from the Japanese Government. Their activity caused some concern to the Spaniards during the rebellion of 1896-1897, and they were constantly under the observation of Her Catholic Majesty's diplomatic representatives in Japan. The Spanish Minister to Japan uncovered some facts of importance in connection with these Filipino agitators. In one place, he spoke of their having intercourse with the Japanese *masoneria*. In a second report, the Filipinos were said to be in contact with the *soshis*. The *soshis* and *masoneria* were elements belonging to the *Genyosha* society and similar organizations of a supernaturalistic character which had begun to work secretly for the unification of the Far East under Japanese leadership. While the Japanese Government, under the circumstances, could not have openly encouraged the ambitions of the Filipino insurrectionists, the secret societies, having among their members men of prominence and influence, were in a position to maintain relations with the *Katipunan*. Marquis Hirobumi Ito, one of the most powerful men in Japan, later admitted that he had been familiar with conditions in the Philippines since 1894.

It was confirmed that the Japanese government attempted to prevent its nationals from negotiating with the Filipinos. In a communication from Yokohama, August 26, 1896, the Spanish Minister informed the Governor-General that the Japanese authorities had taken stringent measures to break up the intercourse between the *soshis* and

Aguinaldo's representatives. In order to be absolutely certain about the matter, the Spanish Government asked the Tokyo Foreign office if there were any Japanese subjects involved in the Tagalog rebellion. Desiring to give Spain complete satisfaction, Tokyo ordered the Japanese Consul at Hongkong to make a thorough investigation. The eagerness of Japan to satisfy Spain was reflected by the fact that this investigation was conducted at a time when the Japanese were in the midst of a severe cabinet crisis.

Despite these precautionary steps, the Spanish authorities were convinced that the Japanese would continue to play a role of increasing importance in the future of the Philippines. Without doubt, the recent success of Japan in asserting herself as a strong nation had encouraged the Filipinos in their attempt to throw off the Spanish yoke. This fact was aired openly by Governor-General Camilio Palavieja who succeeded in crushing the revolt. According to some observers, Aguinaldo's emissaries in Japan had dispatched a petition to the Emperor asking him to establish a protectorate over the Philippines. This petition, signed by some 5,000 Filipinos, was allegedly accepted without comment or subsequent action.

It was also rumored that Spain, tiring of its colonial responsibilities, offered to sell the Philippines to Japan in 1896 for \$3,000,000 gold. The Japanese, according to this account, refused to consider the proposition. On the other hand, an eminent Spanish diplomat, Don Francisco de Reynoso, reiterated that

Japan herself had proposed to purchase the Philippines. Marshal Yamagata, while at Moscow during the coronation of Czar Nicholas II in 1894, tentatively suggested that Spain sell the archipelago to Japan for forty million pounds sterling. Reynoso stated that the Japanese were then disposed to give this sum for the Far Eastern colony because of its strategic location and its possible use for the diversion of their increasing population.

One might speculate at great length as to what would have happened to the Philippines if the War of 1898 between Spain and the United States had not occurred. However limited were the activities of expansionist-minded Japanese in connection with the Filipino rebellion of 1896-1897, they pointed to a program which subsequently was to be adopted as the official policy of the Japanese Government. Another significant but little publicized chapter in the evolution of this program was to transpire during Aguinaldo's insurrection against the United States, 1899-1902.

It has often been said that human progress can be achieved only if we understand the lessons taught us by the careful analysis of history. This is certainly true with reference to our future policies regarding Japan. At the present time, following a bloody war waged victoriously by the United States in checking Japan's predatory ambitions, it must not be forgotten that our former foe's program of empire-building was firmly embedded in the past.



INTERPRETED BY A WAVE

Contributed by LIEUTENANT EDGAR H. MARTIN, *U. S. Naval Reserve*

About a half hour after the morning section of CVG 87's weekend warriors was airborne from the Naval Air Station, Glenview, Illinois, the Army field nearby warned Aerology that it had sighted a *tornado* heading for our air station. Immediately thereafter we went into a Condition Two alert, and planes began landing, it seemed, on all runways simultaneously. No one wanted any of the airplane drivers caught in anything as undeterminable as a tornado.

Shortly after the sirens and whistles sounded the alarm, a Chief Aerographer, with a working party some distance from the Aerology office, called the station switchboard to find out what the warning was for.

"It's just so ridiculous!" answered the Wave switchboard operator. "They told me that a *torpedo* was headed for the station!"

(*The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS.*)



Official U. S. Marine Corps Photograph

READY FOR TARGETS ON LAND OR SEA

This Marine torpedo bomber can bomb enemy targets within a couple of hundred yards of its own infantry front lines.

MARINE CORPS AVIATION—AN INFANTRY-MAN'S OPINION

By MAJOR J. N. RENTZ, *U. S. Marine Corps Reserve*

A LONG with speculation on discussions at the Key West Conference, a new, a fertile field for inter-Service wrangling opened. As a result, reams and reams of paper will be wasted by proponents of Naval Aviation, Marine Corps Aviation, or a single-Service Air Force; yet few if any writers will mention, or even take into consideration the real—the down to earth—reason for aviation as a weapon. An honest appraisal of Marine Corps Aviation and its position in our future military establishment therefore becomes essential.

Talk as they will, the primary reason for the aviator's existence—other than strategic bombing—is support of the infantry, “the Queen of Battles.” Since the day an air service was conceived in the womb of the Army Signal Corps, its basic *raison d'être* has been ultimate support of the soldier fighting on land. Support of ships at sea followed as night follows the day. As a consequence America has developed the strongest single *support* weapon the world has seen since Hannibal introduced the elephant.

Before discussing any subject, a student must acquaint himself with the historical background thereof.

Marine Corps Aviation was born on May 22, 1912, when First Lieutenant Alfred Austell Cunningham reported for duty as a student at the Navy's flight school in Annapolis. Throughout the next few years of its existence, Marine Air underwent growing pains, acquiring techniques, mechanical skills and “know-how” of flying as more and more Marines became interested in the antiquated planes of aviators' early days. World War I gave added impetus to the flight program.

The period of the '20's and '30's marked the development of a mission which became, in World War II, a hallmark of Marine Corps Aviation. In October, 1919, Lieutenant Lawson H. M. Sanderson, attached to the

Fourth Marine Air Squadron, then flying support missions for Marine ground units operating against Haitian bandits, conducted the first successful experiments in dive bombing under actual combat conditions. From that time until the day of Pearl Harbor, Marine Air Squadrons continued development of the doctrine of close air support, practicing it in Santo Domingo, China, Nicaragua, and in the islands of the Pacific.

Low budgets and disinterestedness obstructed maturation of Marine Air during the decades of peace. Congress, generally reluctant to invest in military preparedness, failed to provide funds for aeronautical expansion and research. Meanwhile, most American strategists, lacking an appreciation for the potentialities of the new weapon, relegated aviation to a position of relative unimportance. Thus any progress made by one or another of the air services was in the field of actual combat experience, and this advantage was attained by Marine Corps Aviation alone.

In 1931 units of the Marine air arm were assigned to duty with carriers of the Fleet, and for the three years following the flight decks of the *Langley*, *Saratoga*, and *Lexington* hummed with activity of Marines gaining experience at carrier landings and take-offs. By December 7, 1941, therefore, as far as combat experience was concerned, Marine Corps Aviation might have been more fully

WITH DEGREES from Franklin and Marshall College, Pennsylvania State College, and the University of Pennsylvania, Major Rentz was commissioned in the Marine Corps Reserve on January 30, 1942. Following his war service, he is presently attached to the Marine Corps Historical Division, U. S. Marine Corps Headquarters, Washington, D. C. He is the author of the Marine Corps monograph *Bougainville and the Northern Solomons*.

prepared for combat than any other American air service.

Official recognition and designation of Marine Corps Aviation's wartime missions was made in 1935 when the Navy adopted the Marine Corps Schools' *Tentative Landing Operations Manual*. This publication, and its 1938 replacement, *FTP-167*, spelled out the Marine air arm's role to include, among other things, progressive relief of Naval aviation supporting a landing operation as well as attack in support of ground operations.

From this directive the Marine Corps drew the concept which became the basic function of its aviation branch in World War II, and which, to all intents and purposes, will be its assignment in any future struggle; that is, support of the Fleet Marine Force in amphibious operations. Although Marine pilots, having received their initial training in Naval flight schools, are designated Naval Aviators—fully trained to conduct a purely Naval mission as such—the primary mission of Marine Corps Aviation remains. To execute this assignment it is first necessary to clear the skies of enemy aircraft, then to conduct strafing and close-in bombing attacks when and where requested by Marines on the ground.

In carrying out this duty, Marine flyers frequently operate from aircraft carriers during the initial stages of a landing operation, for adequate shore facilities are not always available. By developing this specialty Marine Air duplicates an activity of Naval aviation, but it is a specialty that cannot be performed by the Air Forces, untrained in carrier landings and unappreciative of naval dispositions, formations, and tactics. On the other hand, Marine pilots are specialists in close-in air support, a tactic discovered and developed by them and later studied and adopted by the Army Air Corps whose Attack Aviation amply demonstrated its practicability. Although duplication of a function again appears to have resulted, close analysis will reveal that Marine aviators place emphasis on air-ground coordination, particularly during the critical ship-to-shore phase of a landing attack. Since the U. S. Air Force is not vitally interested in this type of operation—currently emphasizing training in air-to-air support and strategic

bombing, instead—it therefore remains for Marine Corps Aviation to execute this important function. Furthermore, the specialist training of Marine pilots enables them to perfect the tactical relationship between naval components and Marine ground and air units.

Without bothering to look at the record hung up by Marine Corps Aviation during World War II—it speaks for itself—let us delve into the basis of close-in air support. Just what is it? What does it mean? What is expected of it? What can it do?

Close-in air support is a Marine Corps development. In its accepted military sense it implies immediate and specific assistance by aircraft to infantry units engaged in direct combat with the enemy. This activity is indicative of the objective team-work characteristic of Marines. In this sense, Marines consider aircraft as simply one weapon, along with tanks, artillery, and infantry, made available by the American people to military commanders for the execution of their missions. This concept indicates, moreover, the employment of aircraft in any manner which may be of direct assistance to ground forces, whether engaged in infantry combat ashore or approaching a beach in landing-craft.

As defined by Marine Corps Schools, close-in air support is the *Attack by aircraft of hostile ground targets which are at such close range to friendly front lines as to require detailed integration of each air mission with the fire and movement of the ground forces in order to insure safety, prevent interference with other elements of the combined arms, and permit prompt exploitation of the shock, casualty, and neutralization effect of the air attack*. This doctrine, of course, while it recognizes the necessity and significance of strategic bombing and interdiction attacks, by its very definition excludes all air missions performed outside the range of ground forces. In amplification it may be pointed out that close-in air support is the attack of ground objectives by aircraft employing any or all available agents—bombs, machine guns, smoke, rockets, etc.—within as little as 200 yards of front line troops.

Ground forces, faced with stubborn enemy resistance based on terrain unapproachable

by tanks and immune from the effects of artillery or naval gunfire, call for close-in air support. An air attack conducted on such a target must necessarily be tactically integrated with the ground effort in order that the great shock effect of close-in bombing and strafing may be properly exploited. Without thorough training and a complete understanding of the tactics employed by the ground units, as well as perfect liaison between pilots and supported infantry unit commanders, accomplishment of this delicate task becomes well-nigh impossible. It is likewise essential for the ground units to appreciate the capabilities and limitations of their supporting arm. A perfect meeting of minds must exist. Only through continued training with one another, constantly observing each other's tactics, and actual sympathy for each other's problems may such coordination be achieved.

Marine pilots are trained for the support of landing operations in all its phases, from covering a convoy during its approach to the target to giving close-in support to Fleet Marine Force ground units engaged on the beach; it is in this latter phase that Marine air has become especially proficient. Pilots supporting Marines on the ground must be acquainted with Fleet Marine Force tactics, dispositions, and formations, must recognize Marine uniforms, equipment, and installations, and must be conversant with Marine lingo. Only close and continual association will attain this optimum.

An infantry officer, requesting air support, expects action immediately, *not next week*; he expects the target, *not his command post*, to be destroyed. He has neither the time nor

the patience to brief his air support on factors it should already know. If the air unit has trained with the supported unit during periods of nominal peace, it will then need to know only the location and nature of its target. Other details will be worked out automatically by staffs of the respective air and ground unit commanders. Air-ground liaison, to include signals, directional markers, front-line panels, and the like, will have been perfected beforehand.

Marine Corps Aviation can neutralize targets immediately confronting front line troops. It has done it in the past as attested by the recent war; it can do it at the present time as attested by recent maneuvers; and it will do it in the future, if allowed to work along with and train with Marine infantry.

The Marine on the ground, interested in his own personal safety, to say nothing of the security of his nation, will insist on close-in air support by Marines for Marines. The Marine ground commander must have control of his air support if adequate protection is to be afforded his troops, and if his objectives are to be taken with a minimum of casualties. He cannot afford misunderstandings which may arise as a result of inter-Service differences; he must have close-in support exactly where he wants it and when he wants it. Unless he has Marines to support him, this ideal will in all likelihood be unobtainable.

If another war comes we must be completely prepared. Infantrymen who will be engaged in mortal combat desire the highly trained specialists of Marine Corps Aviation in the planes flying about overhead, prepared at any instant to render close-in air support.



FATAL ERROR

Contributed by LIEUTENANT COMMANDER DANIEL E. NICHOLS, U.S.N.R.

"Learn anything at the Navy Yard?"

"Yeah. Saw a radar operate. Went aboard several ships and took in all I could. Terrible thing happened when we went aboard the first destroyer, though."

"What happened?"

"First five fellows to go aboard failed to salute the ensign."

"My gosh! That is terrible. What did the Ensign say?"

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS).



Official U. S. Navy Photograph

THE SEABEES TRANSFORM GUAM

Highly skilled and experienced, masters of all trades, numbering 260,000 by V-J Day, the Seabees bulldozed the road to Tokyo.

SALUTE TO THE SEABEES

TODAY there are 5,000 Seabees in the United States Navy, most of them serving as maintenance forces at scattered overseas locations. In time of national emergency, they can be rapidly augmented, for the organization has been established and proved: it was the Seabees of World War II, 258,872 strong in July, 1945, who built the road to Tokyo.

The idea of militarizing the Navy's construction workers was actually developed in World War I. The Seabees as they emerged in World War II, however, reckon their "birthday" as 28 December 1941, the day authorization was received for formation of the first Naval Construction Regiment, consisting of three battalions.

The services of contractors and their civilian employees could not be utilized adequately in combat zones. Under military law, a civilian offering armed resistance to an enemy is liable to summary execution as a guerrilla, in event of capture. Furthermore, civilian workers lacked the training neces-

sary to defend themselves. This fact, learned at Wake, Cavite, and Guam, cost the lives of many workers, the capture of more, and created problems beyond solution by civilian personnel in time of war. But the Seabees did the job.

Participating in every major amphibious operation conducted by American fighting forces, either Army or Navy, including the crossing of the Rhine, the Seabees followed the assault waves ashore and, with their many skills, set about constructing the facilities necessary so that the attack might be pushed deeper into enemy territory.

Four Construction Battalions, the 6th, 18th, 20th, and 121st, received the Presidential Unit Citation. The 40th Seabees were awarded the Army Distinguished Unit Badge. Eleven battalions received the Navy Unit Commendation, as did three maintenance units and the 1006th Detachment. Of the Seabees it has been well said: "Their pride in their service is matched only by their pride in the combat forces they serve."



Official U. S. Navy Photograph

BORN OF THE PEARL HARBOR DISASTER

Within a month of that "day of infamy," the Seabees had been organized and were bound for Honolulu. Salvage operations, such as the preserving of this gun barrel from the *Arizona*, were their first major tasks.



Official U. S. Navy Photograph

LAYING MARSTON MATTING IN THE ALEUTIANS

Working in what has been called the world's worst weather, Seabees prepared the Alaskan and Aleutian bases which turned back the Jap's northern drive and then helped recapture and rebuild the former Jap bases.



Official U. S. Navy Photograph

BULLDOZER—SEDAN SUPER-DE-LUXE MODEL

The most glorified of the Seabees' World War II equipment, the bulldozer was no more rugged or versatile than the men who operated it. Above, as usual, it is transforming the landscape on the road to Tokyo.



Official U. S. Navy Photograph

THE GEEHEEBEE BRINGS A LANDING CRAFT ASHORE

With oil drums for floats, this strange super-gadget lifted small boats and barges, became a kind of movable dry dock, and greatly speeded up repairs on damaged craft.



Official U. S. Navy Photograph

THIS LST AND ITS CARGO WERE SAVED BY THE SEABEES

Working twenty-four hour shifts in an Aleutian storm—with williwaw gusts up to 100 miles an hour—the Seabees rescued 30,000 gallons of fuel oil and then patched up the ship so that she could be towed to her home port for repairs.



Official U. S. Navy Photograph

BULLDOZER RESCUES CATALINA

This PBV had been abandoned as a wreck on a hidden reef off New Georgia Island in the Solomons. The Seabee bulldozer managed to snag it off, and thus save another piece of valuable equipment for the war effort.



Official U. S. Navy Photograph

IT TAKES ALL KINDS OF LANDINGS TO MAKE A WAR

On this Marshall Islands beachhead no pontoons were available, but supplies went ashore in a hurry behind a bulldozer. Time after time the Seabees met and resolved just such crisis situations.



Official U. S. Navy Photograph

IS IT BOGGED DOWN?

As a matter of fact, the bulldozer kept on churning through this Admiralty Island muck until a drainage ditch was opened. Meanwhile the preliminaries to setting up an advanced base were getting underway. There isn't much choice between tropical marsh and Aleutian tundra. Both succumbed to the Seabees.



Official U. S. Navy Photograph

THE 40TH BATTALION WORKED AROUND THE CLOCK

"For outstanding performance of duty on Los Negros Island, where its members fought as they built and employed their few leisure hours off duty to attack the enemy"—so reads the War Department citation honoring the Seabees.



Official U. S. Navy Photograph

SEABEES CONSTRUCTED THE TINIAN B-29 BASE

A close friendship and mutual admiration developed between the men who flew and serviced the Superfortresses and the Seabees who made operation of the big bombers from Tinian possible and safe.



Official U. S. Navy Photograph

THE SEABEES DEVELOPED INACCESSIBLE LOCATIONS

Here a chief gunner's mate, tommy gun in hand, guards the bulldozer and operator pushing back the Marianas jungle in an area where Japs had taken to the bush after the conquest of the island.



Official U. S. Navy Photograph

D-DAY RIDE ON A RHINO FERRY

Seabee developed and manned "Rhino Ferries" were used extensively for ship to shore transportation during the Normandy invasion. These self-propelled pontoons were powered with two outboard motors developing 143 horsepower.



Official U. S. Navy Photograph

GETTING THE SUPPLIES ASHORE

This scene at a Loebnitz pier off Colleville, France, shows the artificial harbor in action. Seabees followed up the installation of the U. S. mulberry by employing their "know-how" in unloading precious cargo.



Official U. S. Navy Photograph

SEA HAG—THE SEABEE'S HOUSEBOAT HOME

When Seabees found housing facilities on a Central Pacific Island inadequate, they requisitioned a 1,500-ton lighter and converted it into a "houseboat." The *Sea Hag* was towed to three forward areas, covering a distance of almost 2,000 nautical miles.



Official U. S. Navy Photograph

THIS IS A DE-LUXE MODEL

With a steam kettle for the tub, scrap metal for the agitator, and scrap iron and old inner-tubes for the wringer, *this particular* windmill washing machine boasts an automatic water supply from a nearby tap.



Official U. S. Navy Photograph

DRILLING WITH A 75MM CANNON

The shells drove holes ten inches in diameter and eight to ten feet deep into the rock—ideal apertures for placing dynamite charges. This novel method proved a great time-saver and cost less than half the expense of regular drilling.



Official U. S. Navy Photograph

EVEN MOUNT SURIBACHI DIDN'T ESCAPE

Seabee bulldozers are shown cutting a road into blood-stained Iwo Jima's Mt. Suribachi in transforming that mound of volcanic ash and rock into another stepping stone on the road to Tokyo.



Official U. S. Navy Photograph

A NEWCOMER LEARNS THE ROPES

Picking up pointers from a veteran Chief Petty officer, a newcomer into the Seabees' post-war Organized Reserve earns drill pay while he learns. Over a hundred Seabee Reserve Companies have been formed.



Official U. S. Navy Photograph

EXPERIENCE GAINED IN WAR IS PASSED ALONG

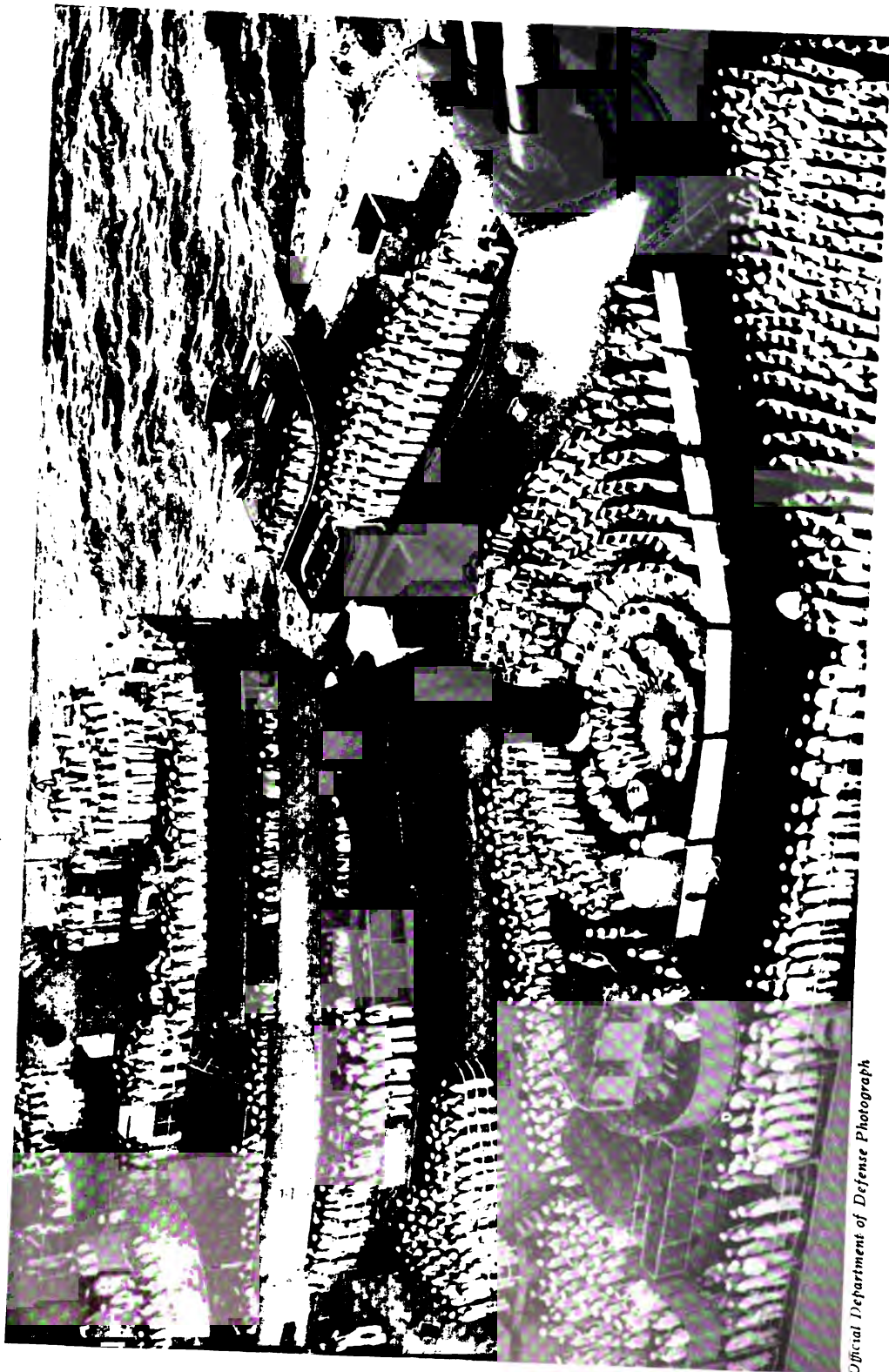
The vital job of manning pontoon causeways over which supplies travel from ship to shore is a specialty in which the post-war trainees are thoroughly practiced. Here a pontoon "string" is launched to be shortly towed into its proper place.



Official U. S. Navy Photograph

LOOKING TOWARD THE FUTURE

This Seabee of the Reserve, who regards his lathe with the deference born of inexperience, will learn the technical and mechanical "know-how" that is so important to the nation in time of peace and doubly so in time of war.



Official Department of Defense Photograph

PUSHBUTTONS HAVE NOT REPLACED MEN

The famous *Missouri*, shown above with her 2,500 personnel grouped around the "surrender plaque" and observing the fourth V-J day anniversary, finds that the experienced "old-line" chiefs have even greater responsibilities despite the contributions of the many specialist ratings.



DISCUSSIONS COMMENTS NOTES

Pushbuttons Need Men

(See page 149, February 1949 PROCEEDINGS)

LIEUTENANT COMMANDER JOSEPH PER-
NAL, U. S. NAVAL RESERVE (INACTIVE).—
In the February issue of the PROCEEDINGS I
read the interesting article by Commander
Fahy on the problem of recruiting technical
specialists for the Navy.

The article sheds light on a serious problem
that is facing the post-war Navy. But it is
hard to agree with the sentiments expressed
by the Chief Electronics technician in the
article. He states: "I've been to the Navy's
technical schools and studied to get this far.
In the past year I've spent over 300 dollars of
my own money for more courses and books
to help me in my job. Yet the Chief Boat-
swain's Mate over there draws more money
than I do, and he can just about write his
own name."

Unfortunately many specialists feel the
same way about the "old line" ratings. What
they fail to realize is that the "old line"
Chiefs are also highly trained and valuable
men. They may not know much about
electronics, but their knowledge was gained
through long years of experience. The Chief
Specialists are generally excused from many
of the responsibilities that an "old line"
Chief has. As the number of Chief Specialists
in our Navy continues to grow, so will the
load grow on the "old line" Chiefs.

As Commander Fahy has pointed out, the
Chief Specialists are very important in our
Navy. It is hoped that more of the Chief
Specialists will learn to appreciate the im-
portant part played by the "old line" Chiefs
in our Navy.

E Pluribus Unum

(See page 815, July 1949 PROCEEDINGS)

COMMANDER LOGAN CRESAP, U.S.N.,
(RET.).—Seeing your comment under the
photograph of the U.S.S. *Menges* on page
815 of the July, 1949 PROCEEDINGS, reminds
me of the following episode in the First
World War.

If my memory serves me correctly, the
British had a class of destroyers named after
African tribes, and of this group of destroy-
ers there were two by the names of H.M.S.
Zulu and H.M.S. *Nubian*.

I don't recall the nature of the disaster
which resulted in the following damage, but
however it was caused, the *Zulu* lost her
after end and the *Nubian* lost her forward
end. The remaining ends were gotten into
port, put into the same drydock, trimmed,
and finally put together to form a new de-
stroyer.

The British took the corresponding ends
of the respective names and called the ship
the *Zubian*!

Graving Dock at Philadelphia Navy Yard

(See page 578, May 1949 PROCEEDINGS)

COMMANDER CYRIL MORAND, U.S.N.R.—
Looking through the May 1949 Naval Insti-
tute PROCEEDINGS I note on page 578 a
photograph of "an early type of graving
dock. Constructed at the Philadelphia Navy
Yard by BuYds&Docks," and that "this
photograph was taken in 1876."

For your information this dock, known as
No. 1 at the Naval Base, was constructed in
1891 under the superintendence of Naval

Constructor Robert E. Peary, discoverer of the North Pole. According to records at the Base, contract for this structure was awarded 18 February 1889 and was completed 18 March 1891, at a cost of \$550,000. It is still in active operation, used for docking smaller vessels, destroyers, submarines, yard craft, etc. The dock is 459' 10" on the floor by 50' width with a depth over the sill of 25' 5".

Its predecessor was the wooden sectional floating drydock transferred from the old Federal St. Navy Yard in 1876, where it was built about 1851. It was abandoned following the completion of the graving dock. This dock was not dissimilar to the sectional floating dock illustrated on the same page (578) in the view of Mare Island Navy Yard.

(EDITOR'S NOTE: The information printed under the picture in the May PROCEEDINGS was quoted almost verbatim from the description on the back of the original photograph when it was sent us. However, we welcome any corrections or additional information, such as is provided in this contribution.)

A Well Disciplined Merchant Marine

(See page 1467, December 1948 PROCEEDINGS, and page 823, July 1949 PROCEEDINGS)

ALDEN W. GOULD, JR.—Lieutenant Crouch's article relative to the discipline of crews aboard Merchant ships of this nation has finally brought out the "facts of life" of the U. S. Merchant Marine, and I for one was glad to read of it.

There are many seaborne services in this land that employ merchant seamen to man their vessels besides the regular Merchant Service. During the war, officers and enlisted men of the U. S. Coast & Geodetic Survey aboard vessels surveying and charting various coastlines, often under hazardous conditions, were subject to strafing, bombing, and whatnot. These men were civilians, every last one of them, from the ship's skipper to the lowest scullion; but were they given bonuses for being bombed, torpedoed, and strafed? No! The personnel of the U. S. Coast & Geodetic Survey at Manila were P.O.W.'s, even though they were civilians. How many merchant seamen were subjected to the same hardships as they, and yet did not make a claim for a bonus for same? The U. S. Department of Commerce is the employer of these men. The individual shipping company is employer of regular seamen.

There is discipline in the U. S. Coast and Geodetic Survey because it is operated efficiently by commissioned officers and personnel who know their business. They need not have seaman's papers to enlist for the one year's tour of duty, as the Federal Government will procure for them the papers that are needed after a regular examination by the U. S. Public Health Service.

Another organization, under the heading of seaborne services, is the U. S. Public Health Service, with its Quarantine Patrol vessels that require seamen. Again there is discipline because of efficient commissioned officers and the willingness of the enlisted men to co-operate.

Another is the U. S. Fish & Wildlife Service that employs seamen for its Fisheries Patrol vessel off the coast of New England. There is discipline there also because of the willingness of the ship's crew to co-operate with the officers on board.

Then there is the largest Merchant Fleet in the world, the U. S. Army Transport Service, formerly under the jurisdiction of the Army Quartermaster Corps, then under Army Transportation Corps, and in 1948 transferred by a special directive of the Secretary of Defense to the U. S. Navy.

This service has a subsidiary, the U. S. Army Harbor Boat Service. The types of craft in the U. S. Army Transport Service range from the lowest barges to the largest transports and hospital ships. Here again the personnel are all civilians in this 15,000 craft fleet. Is there discipline in this service? I'll say there is! With ships like the U.S.A.T.'s *Monterey*, *Admiral Sims*, *Admiral Capps*, *Admiral Eberle*, *Admiral Rodman*, *General Hodges*, and the *Hermitage* and others, there had to be discipline among the crew. Every member of the ship's company held the required U. S. Merchant Marine papers issued by the U. S. Coast Guard, in order to enter the U. S. Army Transport Service and the U. S. Army Harbor Boat Service, but their services along with the Armed Forces (more so than the U. S. Merchant Marine) were never revealed to the public. On my ship, the U. S. Army Transport *Admiral E. W. Eberle* (P-2), formerly U.S.N. APA No. 123, we had on board a mixture of seamen from the U. S. Maritime Service who were at the

last minute detached from the U. S. Maritime Service Training Station, Alameda, California, as well as non-union seamen, and union seamen who couldn't ship on one of their regular union ships, and, rather than starve ashore, set sail on Army Transport Service Craft. Seamen who also held seamen's papers of nations such as Canada, Mexico, Newfoundland, were crew members. Even with such a mixture on board, there was discipline. *There is discipline on board any ship of the Federal Government!* We have a Merchant Marine, other Maritime lands have the Merchant Navy. Why? I do not know. From talks with men who have worn the various uniforms of the U. S. Merchant Marine, U. S. Coast & Geodetic Survey, U. S. Maritime Service, and my own U. S. Army Transport Service and U. S. Army Harbor Boat Service, I find many men and boys are content under supervision. Union minded men will say "No," but how many seamen in the U. S. today would sail ships under U. S. flag if the Federal Government aided by the U. S. Coast Guard supervised them? I would say at least two-thirds of them. No one wants too much supervision, I agree, but discipline is a *must*. I say, "Make the U. S. Merchant Marine a more disciplined outfit," a sort of active reserve (more than it is now), and place efficient crews and Naval trained Officers on board.

Make the U. S. Merchant Marine the U. S. Merchant Navy!

Mooring to a Buoy

(See page 804, July 1949 PROCEEDINGS)

CHIEF BOATSWAIN C. M. ROBINETT, U.S.N. (RET.).—The article "A Method to Expedite Mooring to a Buoy" by Captain W. F. Riggs, Jr., in the July 1949 PROCEEDINGS, outlines an excellent solution to what is frequently a vexing problem. Most of us are familiar with the old buoy mooring situation where the men on the buoy struggle to get the shackle into position, but the cursed thing always seems to be just a couple of feet from the ring.

This method of mooring is not new. When the writer was the boatswain of the *Raleigh* in the late thirties and early forties, an almost identical rig was often used with great success. The average time for completing the

moor after the ship was in position was about three minutes.

Memory being what it is, it is difficult to say now whether or not the idea originated in the *Raleigh*. However, the writer, together with Lieutenant Commander T. C. Aylward and the *Raleigh's* fore-castle boatswain's mates, worked out the details of the method, which was regularly used in San Diego and also a few times at Pearl Harbor.

In the *Raleigh* rig, the connection of the trolley wire to the buoy was expedited by the use of a 5/8 inch wire strap, the bight of which was seized in the eye of the mooring wire. In one end of the strap was spliced a strong snap-hook. With this rig it was a comparatively simple and quick operation for a member of the boat detail to pass one part of the strap through the buoy ring and engage the snap-hook in the eye of the other end of the strap. Occasionally a small shackle was substituted for the hook, this having the advantage of being stronger; but, on the other hand, having the disadvantage of being a bit slower.

One disadvantage of the entire method is that the use of a wire is dangerous to fore-castle personnel if an excessive strain is thrown on the line. Experience in the *Raleigh* proved that it was sometimes advisable, especially in a strong breeze or in a swift current, to run a seven-inch manila hawser from the capstan on the opposite side as both a preventer and a helper for the wire. By using two boats in this case, little delay will be experienced and the added safety contributes to peace of mind.

This comment is not written for the purpose of taking credit from Captain Riggs for his independent development of the method. The writer does not remember who brought the idea to the *Raleigh* fore-castle, but is under the impression that it has been used also by the *Detroit*.

Captain Riggs has rendered a valuable service by sharing his knowledge of the method through the pages of the PROCEEDINGS. If we who used it earlier had been as thoughtful of our fellow seamen as he has been, many commanding officers, first lieutenants, and boatswains might have been spared numerous anxious and embarrassing moments when mooring ship to a buoy.



Official U. S. Navy Photograph

BEHIND THIS KAMIKAZE WERE KOKUTAI NO HONGI

The Kokutai, first translated into English this year, was to the Japan of World War II what *Mein Kampf* was to Nazi Germany—and then some!



BOOK DEPARTMENT

Both regular and associate members of the Institute may save by ordering books through the Book Department. A discount of 10% is allowed on books of other publishers (except on foreign and government publications, and on books on which publishers do not give a discount). Allow reasonable time for orders to be cleared and books to be delivered directly to you by publishers. Address Secretary-Treasurer, U. S. Naval Institute, Annapolis, Maryland.

KOKUTAI NO HONGI. CARDINAL PRINCIPLES OF THE NATIONAL ENTITY OF JAPAN. Edited by Robert King Hall. Translated by John Owen Gauntlett. Cambridge: Harvard University Press. 1949. 200 pages. \$4.00.

REVIEWED BY LIEUTENANT BERTRAM
VOGEL, U. S. NAVAL RESERVE
(ORGANIZED)

Although much has been written in recent years about pre-war, militaristic Japan, no evaluation of that nation's thoughts and ideologies can be regarded with the authority of the *Kokutai no Hongi* (Cardinal Principles of the National Entity of Japan). For the *Kokutai*, now translated into English for the first time, was to the Japan of 1941 what *Mein Kampf* was to Nazi Germany. One can grasp its unique importance when one considers the fact that in its first printing alone, in March 1937, 300,000 copies were prepared and distributed to the teaching staffs both of public and of private schools. By early 1943, almost two million copies of the book had been sold in Japan, and approximately 51,200 reproductions of it had appeared within other books.

And yet, ironically enough, it was almost impossible for American authorities to find a single copy of the *Kokutai* shortly after Japan's surrender in 1945. Professor Hall, editor of the present edition, had, however, already seen it in 1940 during the course of a

raid on a secret Japanese school conducted in Brazil at that time by a former Japanese naval officer. And later, as SCAP's Chief of the Education Sub-Section of Civil Information and Education, he made arrangements for its publication in English here.

Although the *Kokutai's* concern with the mythological founding of Japan and the Imperial Line would undoubtedly seem incredibly unrealistic to the average American, to most Japanese it had an authority and a finality almost without counterpart in the Western World. As Professor Hall carefully points out, the *Kokutai* virtually established "the norms for the social and political thinking of the Japanese." In that respect the *Kokutai* was far more effective than any *Mein Kampf* could even pretend to be. For whereas Hitler's book was a personal philosophy which was ultimately exalted to national policy, the *Kokutai* was a national project and a national policy from the very outset. And it was accepted even by intellectual Japanese as infallible. Under the *Kokutai*, states Professor Hall, loyalty "to the Emperor and to the traditions of the Imperial Line becomes not a duty but the object of life itself."

Certain principles expounded in the section on "Harmony and Truth" are incredible to an American but philosophically acceptable to a Japanese. Thus, for example:

Our nation is one that holds *bushido* in high re-

gard, and there are shrines deifying warlike spirits. . . . But this martial spirit is not [a thing that exists] for the sake of itself but for the sake of peace, and is what may be called a sacred martial spirit. Our martial spirit does not have for its objective the killing of men, but the giving of life to men. This martial spirit is that which tries to give life to all things, and is not that which destroys. That is to say, it is a strife which has peace as its basis with a promise to raise and to develop; and it gives life to things through its strife. . . . War, in this sense, is not by any means intended for the destruction, overpowering, or subjugation of others; and it should be a thing for the bringing about of great harmony, that is, peace, doing the work of creation by following the Way.

Harmony, to the Japanese, was based on the concord of *all things*. And one way or another, all things were made to conform. It is a peculiar paradox which does much to explain the ease with which even public opinion in Japan could be regimented.

According to the *Kokutai*, "The spirit of self-effacement is not a mere denial of oneself, but means the living to the great, true self by denying one's small self." Similarly, self-effacement is part of *bushido*. For, in effect, "man tried to fulfill true life by way of death."

The translation of the *Kokutai* by John Owen Gauntlett, a British professor in Japan, is excellent, and Professor Hall's introduction to the text itself is carefully and intelligently presented. The work is of real value not only to a historic understanding of modern Japan, but to the more immediate problems of Japan's rehabilitation.

ONE STORY OF RADAR. By A. P. Rowe. Cambridge: The Cambridge University Press, 1948. 206 pages. \$2.50.

REVIEWED BY CAPTAIN JOHN L.
MELGAARD, U. S. NAVY

This is the story of the Telecommunications Research Establishment, a group of British civilian scientists, and its role in the research and development of radar during the period from June 1934 to September 1945. The author is well qualified to write of this, as he was with the group from its beginning, and was its wartime superintendent.

In 1934, H. E. Wimperis, the director of Scientific Research in the Air Ministry, shar-

ing the general frustration as regards finding means of early warning against air attack, and aided by the author in calling official attention to this lack of means, established the Committee for Scientific Survey of Air Defense. The head of this committee was H. T. Tizard; and its purpose was to attack the problem with the best civilian scientific brains available. At about the same time, Wimperis had contacted R. A. Watson-Watt of the Radio Department of the National Physical Laboratory concerning the possibility of a radio "death ray." In reply, Watson-Watt proposed the use of the reflection of radio waves as recorded on a cathode ray oscilloscope, as a means of aircraft detection. The Tizard committee, acting on this suggestion, evolved the British radar. The coastal radar warning chain, installed in time, enabled the British to defeat the German Luftwaffe.

The book traces the history of the T.R.E., which succeeded the Tizard committee, from its Bawdsey Research Station group of 150, to the final number of 3000 at Malvern. The development and installation of the first coastal radar chain in 1939, through the later work on airborne anti-submarine equipment, bomber navigation and fighter gun control, is covered in detail.

The author does not discuss technical details of frequency or design of the various radars and associated devices mentioned in the book. Its principle theme and greatest value lies in the emphasis placed on how much can be done with full cooperation between the military establishment, civilian science, and commercial production, in solving the problems of wartime weapons.

WAY OF A FIGHTER. By Major General Claire Lee Chennault, U. S. A. (Ret.), New York, N. Y.: G. P. Putnam's Sons. 1949. 375 pages, including illustrations, maps, and indices.

REVIEWED BY LIEUTENANT COLONEL R. D.
HEINL, JR., U. S. MARINE CORPS

On the strength of *Way of a Fighter*, Major General Claire Chennault, now retired, seems to have qualified as the greatest Army Air Force man of wrath (among a good many) since the late Billy Mitchell. To

aders on the Navy-Marine Corps side fence, Chennault's literary performance will be striking, if only because it unmilitarily autobiography beside which even General Holland Smith's *Coral and* is as mild as milktoast.

General Chennault, for those who may not have been reading the papers since 1940, headed the so-called "Flying Tigers," or (American Volunteer Group) in China, when this spirited legion of mercenaries legitimized after Pearl Harbor, the tenth U. S. Air Force. During the five years previous, on his own account he butted and slashed his way around the S. Army Air Corps as an apostle of air-operations. Likewise by his own admission his crusade in this area of doctrine had yielded little if any fruit by 1937, when he was a captain. What he describes as bomber orthodoxy of the Air Corps holds little or no regard for fighters, and in fact dogmatically stated the dogma—oddly current, in fact—of claims now advanced for the untested B-36—that bombers needed no fighter help, and that enemy fighters mightn't stop bombers anyway. Chennault states how Bissell, an Air Corps officer prominent as a wartime general, suggested prior to the war that the only use for fighter fighters was to drop a ball-and-chain device down on hostile bombers in the act of fouling their air-screws.

After devoting prewar years to the fighter-bomber (in which he turned out to be right), Chennault found himself in two much larger battles, one against the Japanese, the other against General "Vinegar Joe" Stilwell, the put-upon and caustically honest Burma-India U. S. theater commander. To both private wars General Chennault devotes about equal space, and, if anything, is easier on the Japs than on Stilwell, whom he accuses of what amounts to a war against the United States.

Way of a Fighter deserves a very long review not only because of its perfectly undented language, accusations, and general egomania, but because it does, in spite of all its defects, tell you a good deal. In order to develop such themes as why General Chennault hates everybody, the reviewer must require much more space than is

available. Aspects of the book—like the General's bitter years of battle against the single-minded theologians of strategic bombardment—should have a treatment all their own. On the other hand the general does his own case inculpable damage by recklessness of assertion, brag, and a whole raft of internal inconsistencies, misstatements, and avoidable errors. Typical of the former is his letter to President Roosevelt (in October, 1942, mark you) claiming the immediate power to defeat Japan singlehanded, if the U. S. will provide him with 105 fighters, 30 medium bombers, and "in the last phase"—the General qualifies—"12 heavy bombers. . . ." Of the avoidable errors I have noted at least one provable bobble of fact or consistency on pages 15, 17, 41, 57, 96, 102, 105, 118, 131, 142, 174, 188, 218, 226, 237, 243, 254, 276, 291, and 346. It is also surprising, in view of recent emphasis upon the War Department's power to censor the writings of retired Army officers, that General Chennault got away with publishing some parts of the book at all.

Taken all in all, however, *Way of a Fighter* will at least hold your interest, and it should reassure retired Army officers of literary bent that, for the present at least, nobody seems inclined to cramp their freedom of expression.

THE COMMON SENSE OF YACHT DESIGN. By L. Francis Herreshoff. New York: The Rudder Publishing Co. Volume I, 1946. 147 pages. \$12.00. Volume II, 1948, 176 pages, \$12.00.

REVIEWED BY LIEUTENANT COMMANDER
H. O. WERNER, U. S. NAVAL RESERVE
(INACTIVE)

These expensive volumes contain twenty provocative chapters on the subject of yachts, their design and history, together with the author's random thoughts on the arts, the sciences, politics, economics, and life in general. If not quite a Thoreau, at least L. Francis Herreshoff is a rugged individualist in the fraternity of naval architects and small boat designers, although not as much of a heretic as he paints himself. His writing is entertaining, even when most irritating, and his practical ideas are worth the search

through pages of extraneous ramblings. Since these essays are reprinted from *Rudder* magazine, the price of twelve dollars a volume strikes this reviewer as being excessive even in the present high-priced book market.

Mr. Herreshoff's reminiscences are a welcome and valuable addition to American yachting literature, for they are based on a lifetime of acquaintance with the best designers and builders and the finest yachts of the twentieth century. These are not the writing of an on-looker but of a participant, with theory derived from, or tested by, actual experience.

Volume I takes up "Shapes," "Rigs and Sail Plans," "Cabin Arrangement," "Power Plants and Propellers," "Construction," "Materials," "Spars," "Rigging," "Sails," and "Laying Off a Set of Lines." The author's discussion of marine plywood, in the chapter "Materials," explains many of the difficulties that most boat-owners have encountered in handling the product. "Wood shrinks and swells crossways but not lengthways," writes Mr. Herreshoff, "so when you take five or seven layers of wood, each layer crossing the other, you have constructed something that is basically wrong." The true flavor of these volumes is contained in the author's suggestion for remedying the plywood troubles. "It is about twenty years now that I have been trying to persuade laminated wood manufacturers to make it with all of the grain running in the same direction, but they are a stubborn, crossgrained lot and can only think of advertisement."

Volume II takes up "Drafting," "Figuring Displacement," "Measurement Rules," "Power Boat Models," "Choosing a Cruiser," "Marine Hardware and Fittings," "Ground Tackle," "The Sailing Machine," "Small Craft," and "Looks in Relation to Design." This set of ten chapters does not have quite the verve of the first ten, although Mr. Herreshoff is never better than when discussing the uses and abuses of the various measurement rules, giving "the student and the reader a general feeling of the harm that unsuitable measurement rules have done."

It seems inevitable and right that these volumes become an item of standard equipment for the American yachtsman's library. But it is regrettable that the books must be

so expensive, particularly in view of the fact that Mr. Herreshoff, "an advocate of simplicity and sane thinking," as his publishers say, "has influenced yachtsmen in the direction of less expensive yachting both in original cost as well as upkeep."

GUNS ON THE WESTERN WATERS. By H. Allen Gosnell. Louisiana State University Press, Baton Rouge, La. 1949. 273 pages, including introduction and 29 unique photographs and maps. \$6.50.

REVIEWED BY COMMANDER ROY DE S. HORN, U. S. NAVY (RETIRED)

Mr. Gosnell has made a real contribution to American knowledge with his *Guns On The Western Waters*. For too long too many Americans have had a vague idea of the Civil War as being fought and decided entirely between Washington and Richmond, except for the drama of Gettysburg and Sherman's march through Georgia. Here is the premise that maybe the war was really lost and won by what happened on the Western Rivers—the Mississippi and those tributaries flowing into it south of Cairo, Illinois.

Not that there is deep tactics and strategy in Mr. Gosnell's book. Instead there is high adventure, surprises and ambushes, notable feats and notable fiascos, bloodshed and comedy—war's stirring drama with all sound effects. What else could you expect when gunboats were built complete from keel to engines, boilers, guns, and armor within one hundred days? Or when a Union river fleet commanded by a civilian engineer with the rank of colonel in the Army matched shots—and rams—with a Confederate river fleet of ex-river steamers commanded by ex-riverboat captains who had no respect for military technique and even less respect for military authority?

Anything could happen—and did. Like Admiral Porter's ironclads sawing their way through the swamps behind Vicksburg and almost getting trapped by Confederate woodchoppers dropping trees ahead and behind. Or like the Red River expedition, when Porter's gunboat fleet was trapped up-river by falling water—and saved by lumberjacks from Maine and Michigan who dammed the river and then sluiced the ships

through the rapids just as they did logs back home.

If you come from the land of Dixie, you may prefer the epic of the Confederate ironclad *Arkansas*, built in a cornfield, and whose whole life of only 23 days encompassed more desperate fighting than perhaps any other two ships in history. After all, all she did was to whip three Union ironclads the very second day of commission, fight her way through Farragut's entire fleet besieging Vicksburg, and then dodge shelling and fight off day and night attacks for the rest of her career.

But why spoil a good story by telling too much about it here? Rather, let the reader discover it for himself. And in so doing he may unconsciously realize what a tremendous part sea power and amphibious operations played in winning the Civil War—operations without which U. S. Grant would have remained unknown except for his failures, and Sherman never would have reached the take-off place for his march to the sea.

VOUZA AND THE SOLOMON ISLANDS. By Hector MacQuarrie. New York: The Macmillan Company. 1948. 261 pages. Photographs and map endpapers. \$4.00.

REVIEWED BY MAJOR JOHN L. ZEMMERMAN, U. S. MARINE CORPS RESERVE.

Here is a book that will appeal to those who are beginning to look back on the Solomon Islands with nostalgia. It is a collection of authentic South Seas Tales, well written and humorous reminiscences of a New Zealander who served a short, spectacularly unorthodox term as a District Officer there. It tells about life in the islands during the mid-20's, and it confirms what so many of us thought during the chaotic days and nights of 1942—that in times of peace the islands could have been a lovely place.

More important to those who are interested in history, however, is the fact that Vouza, our sturdy native ally and hero during the War, is one of the central figures.

We have often wondered what he was like as a young man, what there had been in his training that made him defy his Japanese captors. This book gives us the answer by implication, for it is the story of a strong deep friendship between the author and Vouza, two young men whose temperaments were as like as their racial origins were unlike. Vouza, in those days, was a Lance Corporal, already beginning the climb up through the ranks that eventually brought him to the grade of Sergeant Major, honorable retirement, and heroism. He was forty-eight when the Marines knew him.

All in all, this is a book of an unobtrusively valuable type. More writing of the kind would increase our understanding of indigenous primitive peoples, and that understanding would enable us to avert the kinds of portentous trouble that are brewing in Southeast Asia, New Guinea, the Philippines, and in Vouza's own Solomon Islands. The reviewer suggests that this volume—and all others like it—be made required reading for those officers on duty in the field of military intelligence.

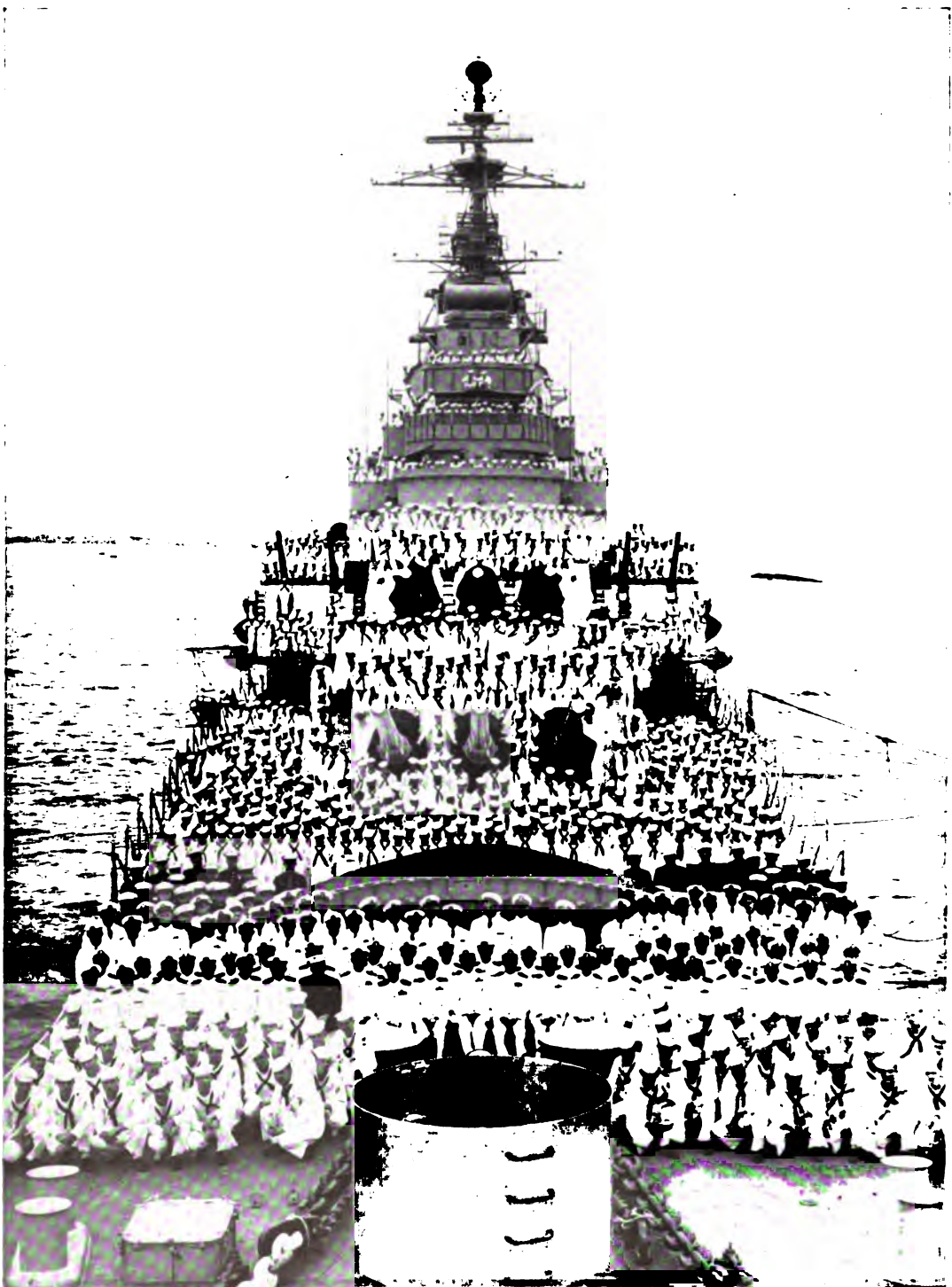
Thumbnail Review

Theory of Oscillations. By A. A. Andronow and C. E. Chaikin. Princeton, N. J.: Princeton University Press. 1949. 358 pages. \$6.00.

This is a condensed and edited translation of the first comprehensive treatment of non-linear oscillations ever to be published. The original work, by two leading members of the Soviet Institute of Oscillations, was published in Russian in 1937 and did not become generally known among English-speaking engineers and mathematicians because of language difficulties.

Made as part of the work on the project on linear differential equations under contract with the Office of Naval Research, this translation by Princeton Professor Solomon Lefschetz is unquestionably a major contribution to the English-language bibliography in the field.

With excellent indexes, attractive format, and a supplementary reading list, this volume is an outstanding example of the work being done incidental to Navy-sponsored research in our leading universities and, in the publishing field, of the important publications coming from the university presses.



Official Department of Defense Photograph

VISITORS TO SPAIN

These officers and men are shown on board the U.S.S. *Columbus*, which with the *Juneau*, *Bordelon*, and *Stribling*, made the Navy's first "informal but official" visit to Franco's Spain.



THROUGH 22 SEPTEMBER

UNITED STATES.....	1304
Warships Visit Spain—Reject General Staff—Subs on High Seas—	
War Games in Germany—Shelve Emergency War Powers Act	
GREAT BRITAIN.....	1307
Fleet Exercises—Visit Turkey—Run China Blockade—New Ca-	
nadian Escort—Cyprus	
FRANCE.....	1309
Sub Schnorkels 17 Days	
U.S.S.R.....	1309
<i>Cochino</i> Accused of Spying	
OTHER COUNTRIES.....	1310
China—Sweden	
AVIATION.....	1312
Navy Led Airlift—Parachute Riggers—Blimps—XB51—Comet—	
Canberra—Brabazon—Jetliner—British Jet Transports	
MERCHANT MARINE.....	1316
New Loading Device—Russian Enigma	
SCIENCE.....	1317
Recorder in Missiles	
INTERNATIONAL.....	1317
Combined Maneuvers in Caribbean—Joint Antarctic Survey—	
Canada-U. S. Arctic Defense Maneuvers	

UNITED STATES

Navy Visits Spain

Christian Science Monitor, Sept. 2.—Madrid.—The forthcoming visit of four United States warships to Spain, though described as "informal," has aroused intense diplomatic and military interest here.

On Sept. 3, Admiral Richard L. Conolly, commander in chief of United States naval forces in the eastern Atlantic and Mediterranean, is expected to bring the ships into El Ferrol harbor for a five-day stay.

Included in the flotilla are the heavy cruiser *Columbus*, Admiral Conolly's flagship; the antiaircraft cruiser *Juneau*, and the destroyers *Bordelon* and *Stribling*.

The fact that the admiral of American naval forces in European waters is making a visit to Spain's principal naval base is considered of great importance.

While the visit is designated as neither "official" nor "courtesy" but is declared to be "informal," speculation nevertheless has been stimulated.

Spanish comment is inclined to center around a query as to whether in the event of war, the United States would seek to use Spanish naval base facilities, including dry-docks. Such speculation, however, is considered to be at least premature.

The visit will involve ample shore leave for the 2,000 crewmen of the flotilla. The Spanish province of Galicia is preparing festivities for them, including a special excursion to Santiago de Compostela.

It has been a subject for comment that this visit to Spain's strategic Atlantic base is coming at a time when American-Spanish diplomatic relations are at a specially low ebb due to opposition of President Truman and State Department to inclusion of Spain in European Recovery Program appropriation.

N. Y. *Times*, Sept. 4.—El Ferrol del Caudillo, Spain, Sept. 3.—Four warships to-day made the United States Navy's first official visit to Generalissimo Francisco Franco's Spain.

A Navy spokesman said the admiral and several other fleet officers would pay their respects to Generalissimo Franco Monday in the Spanish leader's summer home at

near-by Pazo de Meiras. It appeared unlikely that Generalissimo Franco would visit the ships. The Navy spokesman said the visit of the American ships was "informal but official."

He said the American Navy was renewing relations with the Spanish Navy with the intention of adding Spanish ports to its calling list.

Navy Rejects General Staff System

N. Y. *Times*, Sept. 4.—The Navy's General Board has advised Secretary Francis P. Matthews that the service is solidly against any move to impose the Army's general staff system upon it.

It was learned that the Navy stand, which threatened to cause further explosions in the inter-service fight over unification, was communicated to Mr. Matthews in a report dated Aug. 19.

Mr. Matthews asked the board on June 21, one month after he was appointed Secretary of the Navy, for its opinions on adopting the tightly centralized high command system that the Army has used since 1903.

BOARD ANSWERS "NO"

The board's answer was an emphatic "no" to the proposal, which reportedly was advanced by Army men and Defense Secretary Louis Johnson as a further step toward unifying the fighting services.

Navy sources made it plain they regarded the idea as another joint Army-Air Force plan to bring the Navy under control of the other services.

The General Staff is a cadre of officers carefully selected and trained to prepare plans for field officers to carry out.

"Under a general staff system," the board's report said caustically, "officers strive for positions under the General Staff Corps, whereas under the Navy system officers strive for command at sea."

It added that a change-over to the general staff concept at this time would be contrary to the principles that built up the world's best fighting Navy and would not increase the service's peacetime and combat effectiveness.

"Responsible leaders in the Navy are without exception opposed to the establish-

ment of a general staff system in the Navy," said the report, signed by Rear Admiral E. W. Burrough.

"The present organization within the office of the Chief of Naval Operations closely resembles the Army General Staff organization," it said. "However, the Navy system, which segregates 'producer logistics' from 'consumer logistics' with the existing arrangements for coordination by the Chief of Naval Operations, is considered more flexible and superior to the general staff system and results in a high degree of civilian participation in Navy affairs."

The board said it had obtained comment on the question from major fleet and sea frontier commands, district commandants, bureaus and the major offices in the department.

In addition, it heard oral testimony from selected Navy officers and civilians, and listened to a presentation on the general staff system from Col. Kilbourne Johnson of the Army.

The Navy's senior officers are reluctant to comment upon what they refer to as the Army's attempt to impose its system on them. But they say they agree with the recent remarks of Representative Gerald Ford, Republican, of Michigan, during debate on the National Security Act amendments of 1949.

"I submit," Mr. Ford told the House, "that the real basis for this bickering is a deep-seated conflict between those, both in the military and in the civilian life, who favor a republican form of government and those who apparently believe in an extreme concentration of authority and power of decision in a very small and carefully selected cadre of officers known as the General Staff.

"Apparently we are being committed slowly but surely to the General Staff point of view. . . ."

Submarines on the High Seas

Christian Science Monitor, Sept. 2.—The United States naval tragedy off northern Norwegian waters recalls the furor raised something over a year ago when it was publicly disclosed here that Russian submarines had been sighted in the vicinity of Hawaii and the Aleutian Islands.

At that time there was a tendency to assume that Russia had committed a hostile or unfriendly act in letting its submarines cruise in north and mid-Pacific waters.

If the reasoning which prevailed then were to be applied in reverse now, it would follow that the United States had committed an unfriendly act in sending its new Schnorkel-type submarines into Arctic waters.

SPOT NOT DISCLOSED

The Navy Department has not disclosed the exact location of the accident which resulted in the explosion and loss at sea of the United States submarine *Cochino*. But it was stated that the nearest port was Hammerfest, Norway, and Hammerfest is about 250 miles from Russia's principal Arctic Circle port at Murmansk.

There is of course no reason under international law why such maneuvers should not be held—either in the Pacific or the Atlantic. The high seas are open to warships of all nations. Norway, being a member of the Atlantic Pact, is a country the United States would be supporting in event of war, and there is no reason why its submarines should not operate in or near Norwegian waters.

(EDITOR'S NOTE: See U.S.S.R. herein.)

War Games in Germany

N. Y. *Times*, Sept. 5.—Frankfort, Germany.—United States Army, Navy and Air Force units in Germany will begin Tuesday ten days of joint military maneuvers described as the greatest ever held by the United States at home or abroad in which every participating outfit was fully equipped. Observers of the Western union defense organization are to be present.

N. Y. *Herald Tribune*, Sept. 7.—Nuernberg.—Air and ground forces of an "Eastern aggressor army" struck to within eight miles of the Rhine River defense line today, in the first phase of "exercise harvest," the American maneuvers in which the defending forces are striving to save Western Germany from being overrun.

Opening the first joint Army, Navy and Air Force exercises ever attempted, the westward attack of the armored units,

strongly supported by tactical air cover, pushed more than 65 miles from the starting point in a twelve-hour period. The attackers have overwhelming air superiority for the opening phase of the war games.

The "aggressor" army is expected to cross the Rhine tonight at a point near Grossgerau, south of Frankfurt. But a re-grouping of defense forces for a strong counter-attack is expected in the next phase of the twelve-day maneuvers.

TEST OF U. S. POWER

The combined operation, which has placed 110,000 men in the field, is designed to test American defensive and offensive power in Europe. The performance of American air, naval and ground units will, according to top Army officials at maneuver headquarters here, have an important bearing on Western Europe's defense plans.

The "aggressor" force is composed of units of the American Constabulary, commanded by Major General I. D. White. The defending forces consist of units of the 1st Division. It is the first time in post-war maneuvers that aggressors have constituted a real, rather than a paper, army.

The defending forces will make their major defense on the Rhine and Danube Rivers. In the final phase of the maneuvers they will launch counter-attacks which are planned to push the "aggressors" back over the Danube and either surround them or drive them to their eastern homeland, which is officially described as Czechoslovakia and the Soviet zone.

N. Y. *Times*, Sept. 9.—Frankfort.—Former Berlin airlift planes carried an entire combat command of 2,400 soldiers 300 miles by air today to fight a mythical enemy invading western Europe from the east in the United States Army war games.

Twenty-eight converted airlift Skymasters shuttled between Frankfurt's Rhine-Main air base and Munich carrying soldiers, their packs, rations, jeeps, mortars and other equipment in the largest troop operation since end of the war.

The entire combat command of the Eighteenth Infantry was flown to Munich in approximately five hours as scores of high-ranking foreign observers raced hundreds

of miles over the "fronts" to keep pace with the 112,000 soldiers in the field.

Prowling enemy fighters were not able to locate the C-54's, which were flying on instruments through heavy clouds.

The low-lying clouds drove fighter planes into an unusually low mock dogfight when jets of the Thirty-sixth Fighter Group tangled with Thunderbolts of the Eighty-sixth Fighter Wing at 1,800 feet. Shooting Star jet fighters, in the enemy role, drove at least seventy propeller-driven craft from the skies. Two jets were theoretically lost.

The Eighteenth Infantry, maneuvering with the First Division, is fighting as a United States force while tanks of the American constabulary in Nuernberg are playing the role of "enemy," now bent on capturing Munich.

N. Y. *Times*, Sept. 15.—Nuremberg.—The United States Military Command in Germany announced tonight that a permanent Army, Navy and Air Force combined staff might be organized here.

One high officer said that the results of the large-scale United States maneuvers that started Sept. 6 showed the need for such an organization. The High Command insisted that the joint exercises had demonstrated that the three branches could work together in harmony, despite the fact that a dispute flared two days ago between the Army and Air Force over the latter's assertion that it had wiped out a theoretical "enemy" convoy.

A joint statement today by Lieut. Gen. Clarence R. Huebner, Army commander; Lieut. Gen. John G. Canon, Air Chief, and Admiral John Wilkes described Monday's inter-service squabble as "an earnest discussion."

The statement by the three chiefs said: "The joint maneuvers staff for Exercise Harvest [fall maneuvers] has been working together for three months with enthusiasm and determination to make a joint Army, Navy and Air Force action effective."

Emergency Powers Act Shelved

N. Y. *Herald Tribune*, Sept. 8.—Washington, Sept. 7.—The Truman administration has quietly decided not to press for enactment of an over-all stand-by mobilization

plan at this session of Congress, and probably not at the next unless the world situation worsens greatly, it was learned tonight.

Reasons given were two-fold: First, that in order to convince Congress it is necessary, military and strategic information which it is not deemed wise to reveal at this time would have to be made public partially, at least. Secondly, that with a Republican-Southern Democratic coalition opposing the President on many major measures, it is not deemed feasible to plunge such an important defense measure into politics.

N. Y. *Times*, July 3.—The presentation to Congress of "stand-by" wartime legislation—one of the measures Bernard M. Baruch advocated as a step in proper mobilization planning—has been indefinitely delayed under the new concept of the National Security Resources Board's functions as outlined by the President and interpreted by Dr. John R. Steelman, acting chairman.

It frankly recognized the necessity, if another war should come, of the "total mobilization of effort, of persons and of property," and provided for emergency mobilization and control measures much more sweeping than those of the last war, including censorship of communications, price and wage stabilization, control of the labor market, priorities and allocations, etc. The Emergency Powers Act has been completed as far as the National Security Resources Board is concerned and will be restudied and revised from time to time, but it will not be submitted to Congress, if present plans prevail, until and unless an emergency should occur.

This decision—a blow to the concept of sound economic mobilization planning as envisaged by most experts—was accompanied by other steps that have tended still further to de-emphasize the importance of the National Security Resources Board.

GREAT BRITAIN

Fleet's Autumn Exercises

London *Times*, Sept. 6.—The Admiralty announced yesterday the autumn cruise programme for the Home Fleet. Many ships have already left their home ports for Invergordon.

The main ships of the Fleet, including the

fleet aircraft-carrier *Implacable*, flying the flag of the Commander-in-Chief (Admiral Sir Rhoderick R. McGrigor), the cruisers *Diadem* and *Cleopatra*, and several destroyers, will assemble at Invergordon by next Monday and will be joined there by the light fleet aircraft-carrier *Vengeance* (flying the flag of Rear-Admiral C. E. Lambe), the cruiser *Superb* (flagship of Rear-Admiral W. R. Slayter), and other ships.

A month's intensive weapon and tactical training will take place at Invergordon, after which the aircraft-carrier *Vengeance*, the flotilla leader *Agincourt*, and other ships of the 4th Destroyer Flotilla will be detached for combined assault and anti-submarine exercises. While these exercises are in progress other ships will visit ports on the east coast of Scotland, in the Forth and the Clyde, and on the west coasts of England and Wales.

Towards the end of October a tactical exercise will take place in the area of the Minches, and early in November there will be a strategical exercise, for which the Fleet will be strengthened by ships of other Home Commands. Royal Air Force aircraft will engage in this exercise.

Ships Visit Turkey

London *Times*, Sept. 1.—The cruiser *Newcastle*, flagship of Admiral Sir Arthur Power, Commander-in-Chief, Mediterranean, and the frigate *Surprise* are arriving to-morrow at Istanbul on a four-day official visit. Admiral Sir Arthur Power will be received by President İnönü, who is now in Istanbul and then will proceed to Ankara to meet high officials, including the Chief of the Turkish General Staff. After their stay at Istanbul the ships will visit Izmir. Turkish political circles regard Sir Arthur Power's visit as of outstanding importance.

Navy Helps Run China Blockade

N. Y. *Times*, Sept. 6.—Hong Kong.—British warships now are escorting British merchant vessels trading with the Communist-held North China port of Tientsin.

Eyewitness evidence of British naval protection against the blockade efforts of Nationalist warships was brought here today

with the arrival of the British coastal vessel *Hunan*.

Foreigners aboard the *Hunan* said that the ship's departure from Tangku anchorage below Tientsin had been held up twenty-four hours by a Nationalist warship outside the port. A British destroyer intervened, the smaller Nationalist naval vessel gave way and the destroyer then escorted the *Hunan* out of the Gulf of Chihli and around the Shantung promontory for several hundred miles.

New Canadian Escort Design

Christian Science Monitor, Aug. 20.—Ottawa.—The Royal Canadian Navy is building a new escort ship designed as an answer to the high-speed submarine.

During World War II, the Canadian Navy was built into one of the world's largest navies. Its primary job was hunting submarines in the North Atlantic.

Using tiny corvettes and larger frigates, together with a few destroyers, it did an outstanding job getting the convoys through to Britain. But at the end of the war, every navy man knew that the escort vessels were unable to cope with the latest type of U-boats.

The new escort vessel is designed for just that job. About the same size as a small destroyer, it will have only one role in sea warfare—the detection and destruction of submarines. Practically all equipment on board is installed to that end, the only exceptions being two turrets equipped with rapid-firing anti-aircraft rifles.

The new ship will be divided into compartments in such a way that two torpedo hits will not sink her—unless they reach her magazines.

LINES REFLECT ROLE

The specialist role of the new vessel is reflected in its lines. As at present designed, it will be, perhaps, the cleanest-looking craft on the seas.

The designers reasoned that men fighting U-boats seldom see their opponents. So the elevated bridge has been abolished, and the bridge is situated just above deck level on the low, streamlined aluminum superstructure.

The flush deck is quite high out of the water and is designed to provide additional space inside the hull. The steam turbines which will drive the new vessel are of British design, but will be built in Canada. The vessel will have a speed described as "considerably better" than the 20 knots of the war-time frigates which it is designed to replace, and will be equipped with United States-designed radar and guns.

The crew of more than 250 will sleep in American-style bunks, marking abandonment for the first time by the Canadian Navy of the British-style hammocks. Messing will be cafeteria-style.

AIR-CONDITIONING PROVIDED

The ship will be equipped with a built-in movie projection unit, and all working and living quarters will be air-conditioned, both for tropical and Arctic conditions.

The hull will be "stiffened" forward for working in ice, although not sufficiently to enable the ship to be used as an icebreaker. Experience has shown that loose cakes of ice left in the wake of an icebreaker could sink a standard destroyer.

Technically, this "stiffening" of the hull would be useful in the event of ramming. The fact is, however, that ramming has been frowned upon by naval strategists since the latter days of World War II, because many escort vessels damaged themselves more than the submarines.

First contracts for construction of the new ships will call for three vessels to be built. These are described as "pilot" contracts. One vessel will probably be built at Halifax, N. S., another at Montreal, and a third at Vancouver, B. C. The first of the new vessels is expected to undergo tests in the summer of 1951.

Cyprus

London Times, Aug. 9.—As an air centre Cyprus has become immeasurably more important to Britain since the use of bases in Palestine and Egypt has been denied us. It is now our only air base in the eastern Mediterranean area, and as it occupies a strategic position between the Balkans and the Middle East it can play a vital part in the defence system as well as in air transport.

Cyprus lies a mere 45 miles from Turkey, 70 miles from Syria, 100 from the Lebanon, 150 from Palestine, 200 from Transjordan, 240 from Egypt, 350 from Crete, and about 500 from the mainland of Greece and from Cyrenaica. The island is not ideally situated from a military point of view because it is too close to shores which might be occupied by an enemy and because it would be difficult to defend against airborne attack. Nevertheless, aircraft based in Cyprus could reach all these countries, and the island has other advantages for aviation, not least of which are its excellent flying weather and a first-class airfield.

In 1941, after the fall of Greece and Crete, a number of landing fields were built in Cyprus, and the one just outside Nicosia has since been developed as an international airport as well as a military base. Before the war it was a mere grass strip, with huts as the only accommodation. Today, it has three concrete runways long and strong enough for any modern aircraft, an up-to-date control tower, and excellent terminal buildings.

The R.A.F. occupies one side of the airfield and the building of new living quarters and amenities on and near the airfield suggests that Cyprus will be a permanent British air defense point.

Cyprus has already developed into an important air transport center. Because of its location it is a natural "cross-roads" for traffic to the Middle East and beyond, and as it lies at a convenient stage distance for new types of aircraft now being developed or about to start their flight trials its traffic may soon increase still further. Nicosia is used regularly for scheduled services by B.O.A.C. (on its Teheran route), Cyprus Airways (an associated company of B.E.A.), Hellenic Airlines, Middle East Airlines, and Misr Airlines. In addition, it is a frequent port of call for non-scheduled services of British, South African, French, Belgian, Dutch, United States, and Egyptian companies.

FRANCE

Submarine on Schnorkel 17 Days

London *Times*, Sept. 9.—A French submarine 25-18, a former German vessel,

fitted with a Schnorkel apparatus, arrived in Toulon this morning from Lorient, on the south coast of Brittany, having made the whole voyage submerged. The voyage lasted 17 days—or, more exactly, 399 hours. An average speed of five to six knots was maintained. Off the Balearic Islands the Schnorkel apparatus was withdrawn and the submarine dived deep, remaining below for 91 hours. She was under the command of Lieutenant de Vaisseau Guerard.

No untoward incidents were reported during the voyage and the crew are all in good condition, in spite of having to spend the whole time at a temperature between 83 deg. and 85 deg. F. In the engine rooms the average temperature was 104 deg. F. But the greatest hardships, according to the crew, were the prohibition of smoking, the inability to have fresh-water shower baths, and boredom. Each man read about 50 of the 100 detective stories which the commander took on board at Lorient, but he said that the men missed a daily news sheet such as had been issued on British submarines engaged in similar long submersions.

U.S.S.R.

Cochino Accused of Spying

N. Y. *Herald Tribune*, Sept. 21.—Moscow.—The Soviet publication "Red Fleet" said today the American submarine *Cochino* exploded and sank "not far from Murmansk" last month in an American attempt to scout out military information.

[A United States Navy statement at the time said the *Cochino* sank while on a "routine" cruise outside Norwegian territorial waters" on August 26. One member of the *Cochino's* crew was lost, and six aboard the *Tusk*, a sister submarine, perished during rescue operations.]

"Red Fleet" said the place where the *Cochino* sank, never revealed by the American Navy, is known to Soviet authorities.

"By this token," the article continued, "it has become clear to the entire world that the United States naval circles feel it is possible to carry out 'training' along Soviet shores, not far from one of the most important ports of the U.S.S.R.'s northern waters."

The article was headlined: "A New Re-



Official Department of Defense Photograph

"RED FLEET" LOCATES COCHINO SINKING NEAR MURMANSK

Russian publication states that *Cochino* was attempting to scout out military information. The U.S.S. *Corporal*, shown above, is a sistership of the ill-fated submarine which exploded and sank last August.

minder of the Aggressive Plans of the United States in Europe's Northern Waters."

The newspaper said the incident exposed the subservience of Scandinavian countries to Washington. It ridiculed a Norwegian naval statement which said there was nothing surprising about American ships being in the northern Norwegian area.

Groton, Conn., Sept. 20.—Officials at the Navy's submarine base kept silent today about the story in "Red Fleet" which said the submarine *Cochino* was "not far from Murmansk" when it sank last month.

"No comment," said Captain Roy S. Benson, who commanded the four-submarine flotilla of which the *Cochino* was a part.

Rear Admiral James Fife, Commander of Submarines, Atlantic Fleet, was unavailable.

OTHER COUNTRIES

China

N. Y. *Times*, Aug. 27.—Shanghai, Aug. 26—Communist China is building a "people's navy" and a "people's air force" with which to attack Formosa. The capture

or neutralization of that island is essential to the effective breaking of the air and sea blockade of China's coast.

Through defection and seizure these new Communist forces have grown by leaps and bounds in the last few months. Official news reports indicate that about thirty LST's [landing ship, tanks], several destroyer-type of warships and numerous landing craft are already available. Likewise the press here has begun to hint at an impending air offensive against Formosa.

In the last two weeks the Communists seized thirteen islands of the Changshan archipelago, strung in a forty-five-mile line across the strait between Shantung and Port Arthur. They took a Nationalist naval base there, and thus presumably broke the Nationalist blockade of Tientsin, and another North China port.

Peiping has not publicized the over-all figures for its growing navy and air force but the following has been made public:

Of tank landing ships [LST's] five were listed in the Nationalist "second fleet" which went over to the Communists in the Yangtze

er. Another eighteen are listed in the roster of the China Merchants Steam Navigation Company although some of them, presumably, were taken south by the Nationalists. The board of trustees for re-litigation affairs had ten, two of which are in Nationalist hands.

Under the Kuomintang the Yangtze and its tributaries bustled with former United States landing craft and, presumably, many of these are still there. When Chang-sha was taken a few weeks ago it was announced that twelve ships had been found undamaged. When the Nationalists left here they took away or scuttled all the ships they could lay their hands on. Now, however, a local press survey reports that thirty-two of forty-one ships scuttled here have been raised.

60 SHIPS JOIN COMMUNISTS

Communist broadcasts from Peiping have announced the defection of more than sixty naval vessels in the past few months, including the cruiser *Chungking*—later sunk—several destroyers and smaller craft. In addition, Kuomintang Naval and Air Force personnel have appeared in cities like Shanghai and re-enlisted with the new regime, according to official news reports.

The "East China Navy," under the command of Navy Headquarters for the East China Military Area, was established May 1. The new Air Force is believed to have all types of planes furnished by the United States to the Nationalists. Eight planes flew over to the Communists in February, March and April of this year, according to Peiping. "formations" of Mitchell bombers and Mustang fighters flew in the Mukden May Day celebration.

Sweden

Christian Science Monitor, Sept. 16.—Stockholm.—Though Sweden has not fired a shot in anger for almost a century and a half, today the country claims one of the most efficient fighting forces in Europe. Under a universal conscription system, every able-bodied Swedish male gets nine months of basic military training at the age of 18, plus an additional three months somewhere in the course of the next 20 years. Recently the government authorized a 50 per cent increase in the air force fighter strength.

The man directly responsible for Sweden's defense is Gen. Helge Jung, a quiet-spoken, well-weathered professional soldier. Since 1944, General Jung has served as Supreme Commander of the combined Army, Navy, and Air Force Command. His mouth-filling Swedish title is "Overbefallhavare."

While the Swedish Cabinet holds fast to traditional neutrality, and General Jung's position keeps him out of politics, he nevertheless is convinced that in an emergency, the forces under his command would prove far more solid than numerically superior armies honeycombed with subversion and apathy. Accordingly, he says that arming his forces would serve the cause of world security.

In granting an interview, General Jung insisted on furnishing written answers to written questions, as follows:

* * *

Is there anything the general would like to say on the Swedish defense organization now in progress, especially with reference to the air force?

We must arm against a totalitarian war. That means a total defense. From our point of view, such a defense must consist of four parts, the military defense, the civil defense, the psychological defense and, as a basis for all these, the economical preparedness of defense. These four parts compose the links in a chain. None of the links can be weak if the chain is to resist.

As regards the military defense, our country is vast in relation to the population. The latter, therefore, must be made full use of. The feeble density of the population also renders imperative a technically well armed defense. But our economical resources force us to certain restrictions. As we must count on being inferior in a war, we try to compensate for this inferiority by exploiting our natural resources to the utmost, our mountains as protection against different kinds of attacks, our forests and our terrain for a tactical warfare, favoring our own armed forces but of disadvantage to an invader.

The army is developing into smaller units with additional mobility and increased fire efficiency. Our air force has laid chief stress upon the fighter aircraft. By imports it has partly been equipped with jet fighters of good

quality. Aircraft sheds are to some extent built in the rocks and new ones are being built to protect the materials on the ground.

The navy is adopting small and speedy warships with great fire efficiency. It is supported in its operations by a coastal defense in rocky fortifications and by vast natural archipelagos. Even for the navy, sheds are being built in the rocks.

Behind this defense organization we desire to create an effective national total resistance. For this, every Swede capable of bearing arms has to be trained for warfare. Resistance to the utmost in all situations was our maxim during the last war. That maxim still is valid.

It is this gathered, totalitarian defense power that we—together with other democratic and peace-loving nations—want to put in the scales as our contribution for the prevention of a future war, or, if it yet comes, for the preservation of the freedom that has been the main principle of our nation's life from time immemorial.

AVIATION

Navy Squadrons Led in Airlift Efficiency

Chicago *Tribune*, Sept. 12.—Washington, Sept. 11.—Navy planes which participated in the Berlin air lift surpassed air force planes in efficiency, records prepared by the military air transport service (MATS) disclosed.

Two navy squadrons assigned to MATS, which is under air force control, turned in the best efficiency records during the period they were assigned to the air lift. The squadrons had a total of 24 planes.

Navy squadron VR-8, from Honolulu, topped all the rest in efficiency every month that it participated and Navy squadron VR-6 was right behind, the record shows.

The Navy planes beat the air force in daily utilization—9.69 hours to 6.77 hours. That is about 200 tons more capacity a month for each plane of the Navy than of the Air Force. Figuring an average of 19 Navy planes in actual service, this would mean 3,800 tons more a month than 19 Air Force planes of the same type could carry. The Navy, it was revealed, was able to keep

78 per cent of its planes in the air at all times, compared with 54 per cent for the Air Force.

During the best month, April, 1949, the two Navy squadrons averaged 13.2 hours daily service, compared with 12.8 for the best Air Force squadron and 8.04 for the Air Force as a whole.

The Air Force and Navy agreed that maintenance of the planes by ground crews spelled the difference in efficiency. But the Navy says its maintenance was superior man for man, while the Air Force says the Navy simply had more maintenance men per plane.

How Air Force men in the field thought was shown in a letter from Col. R. W. da Vania, commanding the 61st group, to Comdr. J. O. Vosseller, commanding Navy squadron VR-8, which was part of the group.

"You have set a pace unequaled by any task force unit," Da Vania wrote. "The example you have set has inspired younger and less experienced officers of the Air Force units to operational heights beyond imagination."

Navy Parachute Riggers Have Anniversary

N. Y. *Times*, Sept. 2.—Lakehurst.—Twenty-five years ago, on Sept. 1, 1924, two chief petty officers, using an old warehouse, a sewing machine and a packing table, started the Parachute Matériel School at the Naval Air Station here.

The outgrowth of that first class, the present Parachute Riggers School, held open house today to celebrate its silver anniversary, and reported that in those twenty-five years parachutes packed by its graduates had saved the lives of 18,000 airmen.

Lieut. H. E. Ritter, chief training officer of the school, explained that no Navy parachute rigger became a graduate until he successfully jumped with parachutes he had packed himself. Out of the total of 7,800 graduates in the quarter-century of the school's existence there had been only one fatality.

Blimps in Sea Warfare

N. Y. *Herald Tribune*, Sept. 15.—Lord Ventry, Britain's outstanding lighter-than-



Department of Defense Photograph

FIRST AIR FORCE TRI-JET BOMBER

The Martin XB-51 has been designed for short range tactical missions in support of ground forces.

pert who has been in the United States month studying Navy developments, stated yesterday that the airship would be invaluable as a weapon against guided e-launching submarines.

* * *

eriet Russia is known from official statements to be building up a fleet of undersea craft of this type. The Navy is building at Goodyear factory in Akron the world's largest non-rigid airship.

BUILT FOR LAST WAR

ard Ventry disclosed that during the last months of the recent war, when Germany's first experimental Schnorkel submarine appeared, he was called in as consultant to the anti-submarine section of the Air Force. It was the opinion of the anti-submarine warfare chiefs, he said, that the means of detection could not cope with these new-type submarines.

As an antidote to Schnorkel submarines, American-built non-rigid airships were requested for service in the European and Mediterranean theaters and were arriving when Germany's collapse ended the threat, Lord Ventry revealed. He noted that no convoy escorted by Navy airships or blimps in either World War ever had lost a surface ship to an enemy submarine and pointed out that these lighter-than-air craft could carry and operate certain types of detection equipment which no other airborne craft could handle.

Jet Bomber-XB51

Christian Science Monitor, Sept. 19.—An experimental three-engine jet bomber, designed to support ground forces, has been built for the United States Air Force by the Glenn L. Martin Company of Baltimore.

Military officials made a joint announcement with the company Sept. 19 and gave a

few details of the radically designed war-plane, but withheld expected performance.

Now called the XB-51, it is the first three-engine bomber ever ordered by the air force, and the first three-engine jet plane built. Only two planes, to be used for test, have been ordered. The first one is expected to fly within a couple of months.

The new bomber is distinguished by its long fuselage, wings swept back like an arrowhead, its horizontal tail plane sitting atop the upright tail section, and two engines hung on pylons from the fuselage just ahead of the wings. The third engine is in the tail section.

The wing span is 55 feet and the length is 80 feet. Although it has not been announced officially, industry publications have reported that the engines will be the General Electric J-47 turbojet, generally rated the most powerful in production.

Comet Tests Continue

The Aeroplane, Aug. 19.—Test flights on the prototype D.H. Comet jet transport have now accumulated 20½ hours in eighteen flights, and the company reports that on the ground and in the air, during take-off and landing, and when stalling with flaps closed and open, the aircraft handles in a "thoroughly straightforward" manner. This conclusion is borne out by the steadily mounting flight time made since the aircraft flew initially on July 27.

The aircraft has flown over the full C. G. range and at true speeds up to about 430 m.p.h. and reached 36,000 ft.—which is not far short of the cruising speed and altitude. Meanwhile, a series of other production aircraft are being assembled on the production line. The D.H. Ghost turbines in the prototype are 5,000 lb. s.t. units which are type tested at 4,450 lb. s.t.

The estimated date of 1952 when the Comet may be put into service is based upon the present smooth progress being maintained for over two years. Although there is no suggestion of the aircraft being operated before this date, the success of the initial trials indicates that there should not be any delays.

A few further technical details of the aircraft construction are now available. The

powered flying controls used are Lockheed Servodyne hydraulically assisted units and the main undercarriage shock-absorber struts are also made by Lockheed. Last week we referred to the pioneer work carried out by various sub-contractors. As an instance of this associated development, wing stringer sections in D.T.D. 363 material with a maximum thickness on the flanges of 0.06 in. and 0.07 in. on the channel portion were produced by T. I. Aluminium.

More About the Canberra

The Aeroplane, Aug. 26.—A few more details of the English Electric A.1 jet bomber, now named the Canberra B.Mk. 1, have become available.

Designed for high-altitude, high-performance bomber duties, the Canberra is not only the first jet bomber for the R.A.F., but is also the first aeroplane to be powered solely by the new Rolls-Royce Avon axial-flow gas-turbines. One of the most striking features of the Canberra is its low aspect ratio wing—the figure is 4.3:1. The wing appears to be located very nearly mid-way along the fuselage, and the chord represents almost a third of the fuselage length. The wing span is 64 ft., a little less than the length, which is 65 ft. 6 in. Over-all height on the ground is 15 ft. 7 in.

The external layout of the Canberra has several interesting details. Not the least of these is the complete absence of fillets at the junction of the wing and fuselage and wing and nacelles.

The fuselage has a round cross-section, and its lines are broken only by the single-piece moulded cockpit cover. Side-by-side accommodation is provided for a crew of two.

Bomb-doors extend along the underside of the fuselage from just forward of the wing leading edge to a position level with the trailing edge.

The Brabazon Flies

N.Y. Times, Sept. 5.—The Brabazon I, the world's largest civil land-plane, flew today for the first time and landed safely after twenty-seven minutes in the air.

The great plane, whose wings spread 230 feet, wider than the standard New York City block [200 feet], became airborne at about

85 miles an hour after using up only 500 yards of a mile-and-a-half runway. A whole village near Bristol was demolished to make room for the runway.

But the Brabazon I will never carry passengers in the transatlantic trade. Already she is obsolete. An official of the British Overseas Airways Corporation who watched the test flight said that he was especially interested in the flight economics of the Brabazon I so that estimates could be made of the probable performance of the Brabazon II, which will have eight propeller-jet engines and many changes in design.

With the Brabazon II, BOAC hopes to carry 100 passengers across the Atlantic. However, it will be several years before passengers can buy tickets for Brabazon flights as a good deal of development work remains to be done.

Canada's "Jetliner" Tests

The Aeroplane, Aug. 26.—After a sixty-minute initial flight from Malton runway in Ontario on August 10, the Avro C.102, four-engined jet transport—now called the Jetliner—enters a period of handling flight trials and tests to qualify for its C. of A. Chief test pilot of the parent firm at Manchester, J. H. Orrell, visited Avro Canada's works and, together with Avro Canada's chief test pilot, Don Rogers, will carry out initial trials; later Mr. Orrell will return to this country. The only other member aboard the aircraft on its first flight was Mr. Baker, the flight engineer.

The Jetliner is intended for high-speed inter-city travel. If the very difficult development problems of the pure-jet air liner can be solved in the next two or three years, the Commonwealth will be well placed by the middle of the 'fifties, with jet air liners for both long- and medium-range routes.

The Jetliner has one significant advantage over the Comet in the choice of powerplant. Although the Ghost has profited from the design and running experience accumulated in the Goblin, it is nevertheless, a comparatively new engine with a relatively short operational life. The Derwent, on the other hand, has been produced in larger numbers than any other British jet engine and like the Goblin is regarded by the R.A.F. as a "piece

of clockwork." The Jetliner starts its life with an engine which is highly developed after years of experience and thousands of hours' flight running time.

(EDITOR'S NOTE: Previous reports have appeared on all four of the above aircraft in earlier issues of the PROCEEDINGS.)

British Far Ahead in Jet Airlines

N.Y. *Times*, Sept. 8.—Farnborough, England.—Britain went all out here today in a demonstration of her aircraft of every category, aircraft of today and tomorrow. The first conclusion that must be drawn is that the tight little isle is better prepared to fight another "Battle of Britain" if Russia should move than she was when Adolf Hitler struck.

Another important conclusion is that in commercial air transport dollar hungry Britain is prepared to offer the airlines of the United States and of the rest of the world jet and turbo-prop transports that threaten the command of the commercial airfield hitherto held by Douglas, Lockheed and Boeing.

United States Air Force observers took in stride the performance of advanced type British jet fighters. They watched with considerably diminished equanimity when Wing Comdr. R. P. Beanont put Britain's first jet bomber, the Canberra, through paces that Capt. "Chuck" Yeager might have envied in the latest type Republic F-84.

The most astonished observers, however, were airline men from the United States, who remarked when a De Havilland four-jet Comet flew over Farnborough: "Good Lord, we haven't got a fighter as clean as that one."

AIRLINE MEN IMPRESSED

The same observers remarked that not less than four other jet and turbo-prop transports had participated in the show "and we haven't got one in the air—we haven't got one even in the advanced design stage."

British officials were perfectly frank in their expressed determination to go after the air markets with what had been shown here today.

"We have been buying your Constellations and Stratocruisers" said Sir Archibald Rowlands, Permanent Secretary of the Ministry of Supply. "Now we believe we

have a legitimate reason to get back those dollars through the remarkable technological advance our industry and the Government have achieved."

MERCHANT MARINE

New Loading Device

N.Y. *Herald Tribune*, Sept. 9.—Brigadier General Paul Yount, commanding officer at the New York Port of Embarkation, Fifty-eighth Street and First Avenue, Brooklyn, estimated yesterday that loading and unloading of combat vehicles could be speeded up as much as 50 per cent through the use of a new cargo-handling device exhibited yesterday by the Army.

The device consists of two movable decks and is designed to facilitate under-deck storage. Captain V. C. Farrell, the inventor, conducted yesterday's exhibition aboard the Army cargo transport *Private Francis X. McGraw* at the Brooklyn Army base. Representatives of a dozen local steamship lines, the Navy, American Bureau of Shipping, Maritime Commission, Bethlehem Steel Company, stevedoring companies and the International Longshoremen's Association, A.F. of L., attended the afternoon exhibition.

Captain Farrell, who expressed admiration for the "farsighted and progressive policy" of the Army Transportation Corps for authorizing the experiment, predicted that it would be useful also for coast-wise and inter-coastal shipping. "If adopted, it should materially assist in restoring domestic shipping to its pre-war stature," he said. He said the device could be modified to hold loaded trailer truck bodies, with wheels removed.

As exhibited, the rolling decks were installed in one of the *McGraw's* forward holds. General Yount, who was enthusiastic about the experiment, said that no voyage had yet been scheduled for the transport, but that the device would be given a thorough test under realistic conditions.

Russian Maritime Riddle

Marine Journal, August, 1949.—Soviet Russia, which was expected to become a leading competitor on the world's sea lanes, has failed to emerge as a dominating maritime nation in the four years since VJ-Day, the American Merchant Marine Institute finds.

Despite the acquisition of valuable tonnage through German reparations and the retention of 86 American ships made available under Lend-Lease, the Red merchant fleet is less a factor than it was pre-war. From a commercial standpoint, the irregularity and the apparent inefficiency of its operations prevents Russia from being a competitor on the regular routes.

While an "iron curtain" on even routine shipping information makes it difficult to ascertain the true status of the Soviet merchant marine, the known operations of its ships furnish ample evidence that Russia is far from being a threat to other maritime countries.

For instance, the flagship of the fleet, the *Rossia*, formerly the German passenger liner *Patria*, made six round voyages between New York and Odessa. But since the end of April, 1948, this ship of 17,870 gross tons, the largest diesel-electric liner afloat, has not left the Black Sea. Another example is the *Asia*, an ex-German liner of 11,453 gross tons, which left England for Murmansk in January 1947 and has not been reported since. Some other Russian liners have been dispatched to the Far East but only speculation can explain what they would be used for along the barren coast of the Okhotsk Sea.

Its freight ships maintain no regular service and only a small percentage of them are engaged in trade outside of Russian waters.

In 1946, the Russians announced a five year plan to expand its merchant fleet by doubling the pre-war tonnage of 1,600,000 tons. As of Jan. 1, 1949, the Russians had 423 ships of 1,788,000 deadweight tons. More than half of this fleet is at least twenty years old and has a speed of less than 12 knots. Although an entire shipyard had been dismantled and moved from Germany, there have been few reports of Russian shipbuilding.

If Russia is to reach its goal of 3,200,000 tons by 1950, it will be attained chiefly by keeping 86 American ships which it has refused to return to this country. These will add 811,000 deadweight tons to its merchant fleet and will give it ninth place in world shipping.

Of the 127 freighters and tankers originally transferred to the Soviets on Lend-Lease be-

tween July 1942 and May 1945, only 34 have been returned, while 7 were lost. For almost three years the State Department has been attempting to bring about the re-delivery of the balance and its last note of Jan. 11, 1949, has received no reply from the Soviets. Maritime Commission officials told the House Appropriations Committee recently it is "nearly hopeless to hope" that the ships will be returned.

The Institute reports the Reds have shown a decided preference for the easy-to-operate Liberty cargo ships and have hung on to all 38 of this type. For some unexplained reason, the Russians who have only a relatively few tankers, have retained only one of the 20 tankers loaned them. Perhaps for sentimental reasons they decided to keep the twenty-eight year old former American tanker the *J. Fletcher Farrell* which is now known as the *Josif Stalin*.

With the State Department pressing for the return of these ships, the Russians have found it prudent to keep these particular vessels out of American ports. Those whose movements can be traced through their operations outside the "iron curtain," operate chiefly from Black Sea or Baltic ports, or in the Far East.

In view of the embargo placed on exports to Russia, few ships flying the Hammer and Sickle come to the United States. In a twelve month period prior to June 30, 1949, only five Russian ships came to the Port of New York as compared to twenty-one in a similar pre-war period.

SCIENCE

Robot "Typists" Used on Navy's Guided Missiles

N.Y. *Herald Tribune*, Sept. 19.—The United States Navy, which regards guided missiles as basic naval weapons, has developed a robot "airborne stenographer" to accompany its newest missiles and record test data during supersonic flights to high altitude; it was learned yesterday.

The Navy is devoting a greater percentage of its research and development funds to guided missiles than to any other category of research to produce weapons that will extend the striking range of its mobile task forces

and schnorkel submarines. Its new device will be installed in the nose of missiles before firing.

The recording tape on which the information for Navy scientists can be preserved is made of steel and leads into an armored container strong enough to withstand the shock of hitting the ground from high altitudes.

In tests recently completed the armored container frequently was the only intact part of a missile recovered from the crater dug by its meteorlike fall.

After being recovered, the steel recording tape measuring 150 feet long by six inches wide can be played back through a transcriber and its test data plotted on charts. The device is capable of recording 200 pieces of information simultaneously and continuously, including such factors as air pressure, temperature, speed and gyro positions. Such recordings are done electrically.

The entire recording device weighs only forty-six pounds and measures slightly over ten inches long and eight inches in diameter. Most of the development work on it was done by United Aircraft Corporation and the Armour Research Foundation of the Illinois Institute of Technology as part of a project under Project Meteor of the Navy's Bureau of Ordnance.

Plans for the "airborne stenographer" were initiated in United Aircraft Corporation's research department in East Hartford, Conn., and considerable laboratory work was done there.

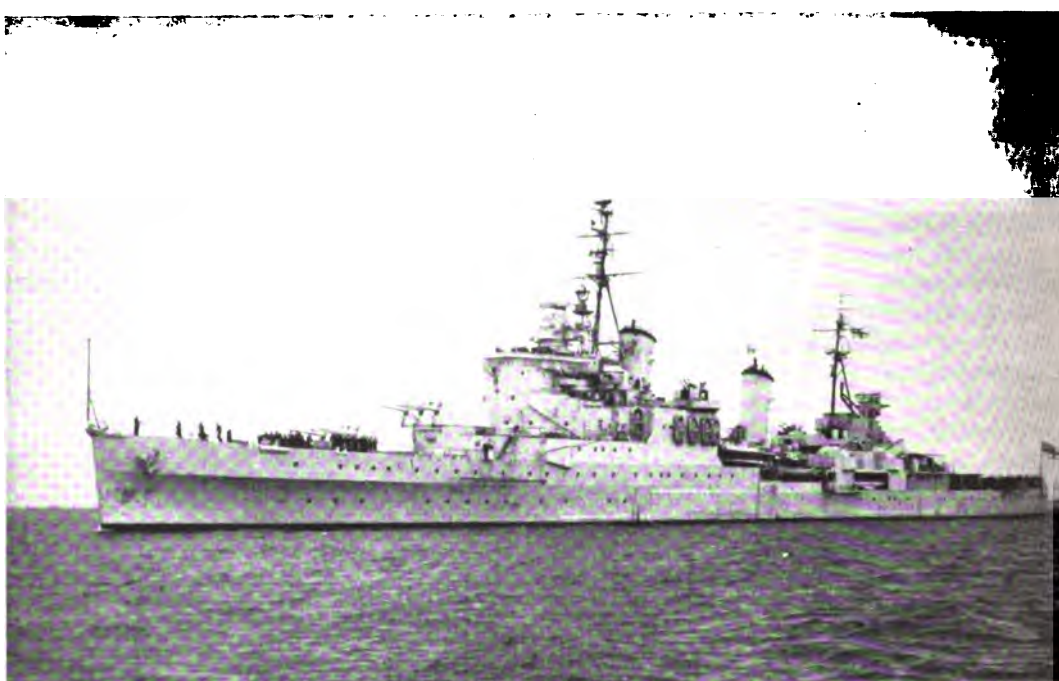
The research department is now working on a still smaller version of the recorder which measures only seven inches long and six inches in diameter. According to Navy scientists, the recording devices will make possible the gathering of information that up to now has not been accessible.

A demonstration will be held before representatives of the armed services on Sept. 29 in Cambridge, Mass., at the Massachusetts Institute of Technology.

INTERNATIONAL

Three Countries Plan Naval Maneuvers

N.Y. *Times*, Sept. 17.—The British cruiser *Glasgow*, which had a long and distinguished record in the late war, docked at



Official U. S. Navy Photograph

H.M.S. GLASGOW AT ANCHOR OFF ANNAPOLIS

The 12,000 ton *Glasgow* and the frigate, *Snipe*, visited American waters this autumn. While at Annapolis, boat crews from the English ships lost a spirited race to the *Reina Mercedes* oarsmen.

sundown yesterday at Pier 54, West Fourteenth Street, on a courtesy visit under the command of Vice Admiral R. V. Symonds-Tayler. It was learned that seven months hence this warship together with a couple of frigates will participate in joint maneuvers with a United States fleet in the Caribbean area.

Disclosure of plans for a combined Anglo-American naval operation within the shadow of the continental United States was no part of the admiral's intentions since he made it plain the Navy in Washington wants the whole scheme on the secret list.

The British commander simply noted that the ships under his flag would maneuver with Canadian forces next March and April in northern Caribbean waters. American naval representatives welcoming him yesterday said they, too, were planning an exercise with the Canadians at the same time and place.

One officer of the *Glasgow* commented privately: "We can see no earthly reason why this maneuver shouldn't be announced.

It seems to us the best sort of good-will gesture and actually very sound naval practice under present-day circumstances."

Serving in Admiral Symonds-Tayler's America and West Indies Station, comprising an area "from pole to pole and several hundred miles east and west of both American continents," are the 12,000-ton *Glasgow* and three frigates, the *Snipe* now at Albany, the *Bigbury*, on hurricane duty off Bermuda, and the *Sparrow*, at home for refitting.

Joint Antarctic Survey

London *Times*, Aug. 6.—Preparations for the joint Norwegian-British-Swedish expedition to the Antarctic are now practically complete and a start is to be made in about three months' time. The expedition's ship *Norsel*, a Norwegian sealer of some 700 tons now undergoing alterations at Flensburg, will call at Gothenburg, Sweden, on November 1 to load Swedish equipment and supplies, and then proceed to Oslo to continue loading.

It is expected that the expedition will sail from Oslo on November 15, call at a British port to take on board British members of the party and further supplies, and then proceed to Capetown, which will be the last port of call before leaving civilization. Although the expedition was first suggested early in 1946, final plans were made only a little over a year ago. On the basis of these the Norwegian Storting, in June, 1948, granted an initial amount of 200,000 kroner (£10,000) for the preparations, and the Swedish and British Governments provided for participation from their countries.

In the coming season, 1949-50, the main task will be the establishment of the base station in Queen Maud Land. As yet no ship built for navigation in ice has tried to penetrate the belt of drifting ice off Queen Maud Land, nor has any attempt been made at wintering on that coast. The expedition may run into unforeseen difficulties, but for reconnaissance purposes will carry two small Auster aircraft, supplied by the R.A.F. If the coast can be reached, the base station will be established early in 1950, and meteorological and glaciological observations started. The former will continue without interruption for two years, but during the Antarctic summer of 1950-51 the geologists, glaciologists, and surveyors will spend several months on field trips. In that season it is hoped to bring two larger aircraft south for aerial photography. The spring of 1951-52 may be used to supplement the field work, and in January, 1952, provided all goes according to plan, the expedition will return home.

(EDITOR'S NOTE: See October PROCEEDINGS—Byrd Expedition Cancelled.)

Canada-U. S. Arctic Defense Maneuvers

Christian Science Monitor, Sept. 6.—Canadian and United States ground and air units will work out fighting techniques this winter for combined defense of the critical Arctic frontier.

The army announced that "Exercise Cross-Index"—involving comparatively small units of the armies of the two nations, supported by the United States and Royal Canadian Air Forces—will be conducted in the Yukon and Alaska areas near Whitehorse, Yukon Territory, during January and February.

Each army will provide a "one-battalion combat team including infantry—some of which will be employed in a parachute role—artillery, engineers, signals and other supporting arms and services," the formal announcement said.

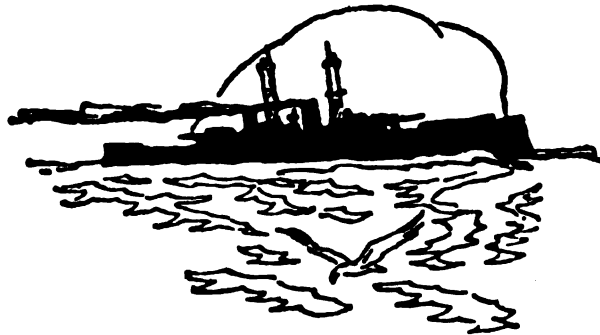
Army officials declined to specify the total number of men involved, pointing out that the size of a combat team varies widely, depending on its mission.

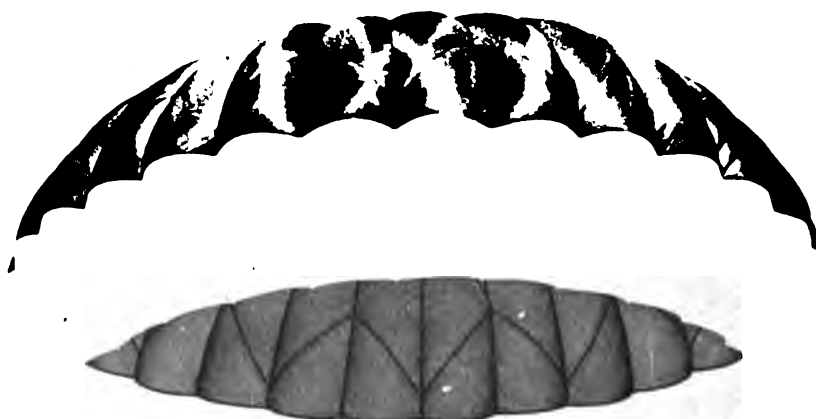
FIGHTER COVER

The two air forces will provide fighter cover for troops and bomber, reconnaissance and transport planes.

"In addition to existing communications, mobile RCAF and USAF signals equipment will be used," the army said. "Mobile air force radar and control centers will also be employed."

Canada and the United States are undertaking to build a permanent chain of radar aircraft detection stations across the northern rim of the continent to warn of the approach of hostile craft across the polar cap.





Official Department of Defense Photograph

SAFER CHUTE FOR HIGHSPEED BAIL-OUTS

The initial shock in bail-outs from planes at speeds of 300 miles per hour is from 25 to 30 times the force of gravity. This new Navy designed parachute cuts this initial shock by novel soft-opening features.



More New Institute Books

In addition to *Round-Shot to Rockets*, the history of the Washington Navy Yard and U. S. Naval Gun Factory, and *Naval Leadership*, which has already gone into its second printing within one month of the first edition, three important new books published by the Naval Institute are just coming off the presses. *Russian Grammar and Conversation*, an inductive method for first-year students of Russian, is written by Associate Professor Claude P. Lemieux of the Department of Foreign Languages, U. S. Naval Academy. The approved text for midshipmen beginning the Russian Language Course, it is probably the most complete text book of its kind yet published in this country.

Engineering Materials and *Combustion Engines Manual* are two new books produced under the supervision of the Department of Marine Engineering at the U. S. Naval Academy for use as textbooks for midshipmen in the engineering course. Containing the latest scientific information developed during the war and post-war periods, these engineering books are published in a form as advanced as their content. In place of the ordinary stiff binding, these books are printed in loose-leaf form so that the results of new discoveries, developments, and practices may be added at any time. But the leaves are bound into a durable, flexible cover by means of hidden screw binding posts which secure the whole content in a compact volume that will stand up to hard usage.

Information on prices and other details of these books will appear in the PROCEEDINGS in the near future.

That Prize Essay Deadline

Readers of the PROCEEDINGS are reminded that all essays entered in the U. S. Naval Institute General Prize Essay Contest must reach the Naval Institute not later than January 1, 1950. There is still plenty of time for interested authors to write their essays, but better results are achieved by beginning early than by waiting until the last moment and then rushing the job. First prize carries a gold medal, a life membership in the Institute, and a cash award of not less than \$500 or more than \$1500. See the back of this page for information as to other awards and also the rules for entering the contest.

Reprints of Proceedings Articles

Authors requesting reprints of their articles in the PROCEEDINGS usually receive their reprints in about six weeks after the articles themselves appear in the PROCEEDINGS. This is due to the fact that the printer is compelled to make these reprints in vacant periods in his crowded schedule.

Navy's New Parachute

Designed for highspeed bail-outs from jet planes, Navy's new "extended skirt" nylon parachute will become standard equipment in Navy jet and other fighter aircraft early in 1950. Of four foot greater diameter than the present 24 foot model, the new parachute reduces by half the initial shock for bailouts at 300 or more miles per hour.

Special Notice

U. S. Naval Institute General Prize Essay Contest, 1950

A PRIZE OF NOT LESS THAN \$500 and of not more than \$1,500, a gold medal, and a life membership in the Institute will be awarded for the best essay submitted on any subject pertaining to the naval profession, should the Board of Control consider the essay to be of sufficient merit. Should the prize be awarded to a previous winner, a gold clasp suitably engraved will be given in lieu of the medal and the commuted value of the life membership in lieu of the life membership.

Irrespective of the award of the "Prize," one or more essays may receive "Honorable Mention," if of sufficient merit to justify the award. Essays awarded "Honorable Mention" shall receive such compensation as may be adjudged by the Board of Control, but not including a life membership.

In the event that no essay is adjudged of sufficient merit to receive the "Prize" or an "Honorable Mention," the best essay submitted may receive a special award in lieu thereof.

The following rules will govern this competition:

- (1) Essays should not exceed 8,000 words.
- (2) Essays must be received by the Secretary-Treasurer on or before January 1, 1950.
- (3) The name of the competitor shall not appear on the essay, and each essay must have a motto in addition to the title. This motto shall appear (a) on the title page of the essay, (b) on the outside of a sealed envelope containing identification of the competitor, (c) above the name and address of the competitor inside the envelope containing this identification. This envelope will not be opened until the Board has made the awards. Essays and identifying envelope must be mailed in a large sealed envelope marked "General Prize Essay Contest."
- (4) The awards will be made by the Board of Control, voting by ballot and without knowledge of the names of the competitors.
- (5) The awards will be made known and presented to the successful competitors as soon as practicable after the February meeting of the Board.
- (6) All essays must be typewritten, double spaced, on paper 8½" x 11", and must be submitted in triplicate, each copy complete in itself.
- (7) Essays awarded the "Prize," "Honorable Mention," or "Special Award" are for publication in the Naval Institute PROCEEDINGS. Essays not awarded a prize may be published at the discretion of the Board of Control, and the writers of such essays shall be compensated at the rate established for articles not submitted in competition.
- (8) Attention of contestants is called to the fact that an essay should be analytical or interpretive and not merely an exposition or personal narrative.

William G. Cooper,
Captain, U. S. Navy, Secretary-Treasurer

UNITED STATES NAVAL INSTITUTE PROCEEDINGS

*For the advancement of professional, literary and
scientific knowledge in the Navy*

December, 1949

Edited by CAPTAIN W. G. COOPER, U. S. NAVY

Managing Editor—COMMANDER ROY DE S. HORN, U. S. NAVY (RET.)

Associate Editors

CAPTAIN JOSEPH M. P. WRIGHT, U. S. NAVY

COMMANDER C. P. LEMIEUX, U. S. NAVAL RESERVE (INACTIVE)

LIEUTENANT COMMANDER H. O. WERNER,
U. S. NAVAL RESERVE (INACTIVE)



United States Naval Institute

Publication Office: Menasha, Wisconsin

Editorial and Business Office: Annapolis, Maryland

Advertising Department: 2000 Connecticut Ave. N.W., Washington, D.C.

Copyright, 1949, by U. S. Naval Institute

Officers of the Institute

President ADMIRAL LOUIS E. DENFELD, U. S. NAVY
Vice-President REAR ADMIRAL JAMES L. HOLLOWAY, JR., U. S. NAVY
Secretary-Treasurer CAPTAIN W. G. COOPER, U. S. NAVY

Board of Control

ADMIRAL LOUIS E. DENFELD, U. S. NAVY (ex officio)
REAR ADMIRAL JAMES L. HOLLOWAY, JR., U. S. NAVY (ex officio)
REAR ADMIRAL ELLIS REED-HILL, U. S. COAST GUARD
CAPTAIN ARLEIGH A. BURKE, U. S. NAVY
CAPTAIN M. A. SAWYER, U. S. NAVY
CAPTAIN ROBERT B. PIRIE, U. S. NAVY
CAPTAIN ROBERT H. RICE, U. S. NAVY
MAJOR JOHN E. WILLIAMS, U. S. MARINE CORPS
CAPTAIN W. G. COOPER, U. S. NAVY (ex officio)

Past Presidents

ADMIRAL DAVID D. PORTER, U. S. NAVY, 1873
REAR ADMIRAL JOHN L. WORDEN, U. S. NAVY, 1874
REAR ADMIRAL C. R. P. RODGERS, U. S. NAVY, 1875-78
COMMODORE FOXHALL A. PARKER, U. S. NAVY, 1878-79
REAR ADMIRAL JOHN RODGERS, U. S. NAVY, 1879-82
REAR ADMIRAL C. R. P. RODGERS, U. S. NAVY, 1882-83
REAR ADMIRAL THORNTON A. JENKINS, U. S. NAVY, 1883-85
REAR ADMIRAL EDWARD SIMPSON, U. S. NAVY, 1885-87
REAR ADMIRAL STEPHEN B. LUCE, U. S. NAVY, 1887-98
REAR ADMIRAL WM. T. SAMPSON, U. S. NAVY, 1898-1902
REAR ADMIRAL H. C. TAYLOR, U. S. NAVY, 1902-1904
REAR ADMIRAL C. F. GOODRICH, U. S. NAVY, 1904-1909
REAR ADMIRAL RICHARD WAINWRIGHT, U. S. NAVY, 1909-11
REAR ADMIRAL BRADLEY A. FISKE, U. S. NAVY, 1911-23
VICE ADMIRAL WILLIAM L. RODGERS, U. S. NAVY, 1923-24
ADMIRAL HENRY B. WILSON, U. S. NAVY, 1924-26
ADMIRAL HILARY P. JONES, U. S. NAVY, 1926-28
REAR ADMIRAL EDWARD W. EBERLE, U. S. NAVY, 1928-29
ADMIRAL S. S. ROBISON, U. S. NAVY, 1929-31
REAR ADMIRAL M. L. BRISTOL, U. S. NAVY, 1931-33
ADMIRAL WILLIAM H. STANDLEY, U. S. NAVY, 1933-35
ADMIRAL DAVID FOOTE SELLERS, U. S. NAVY, 1935-37
FLEET ADMIRAL WILLIAM D. LEAHY, U. S. NAVY, 1937-40
ADMIRAL H. R. STARK, U. S. NAVY, 1940-42
FLEET ADMIRAL CHESTER W. NIMITZ, U. S. NAVY, 1942-43
FLEET ADMIRAL E. J. KING, U. S. NAVY, 1943-46
FLEET ADMIRAL CHESTER W. NIMITZ, U. S. NAVY, 1946-48

For the Advancement of Professional, Literary, and Scientific Knowledge in the Navy

RAISING THE FLAG ON MT. SURABACHI. Color reproduction of the famous Associated Press Photograph by Rosenthal.....	<i>Front Cover</i>
THE CRUISE OF THE GERMAN RAIDER <i>Atlantis</i> , 1940-1941.....	1323
<i>By Richard S. Pattee</i>	
CAN WE AFFORD IT?.....	1335
<i>By Captain E. B. Perry, U. S. Navy, Retired</i>	
A MERCHANT MARINER LOOKS AT THE NAVY.....	1343
<i>By Commander C. W. Sandberg, U. S. Maritime Service</i>	
A SAVINGS PROGRAM FOR THE NAVAL OFFICER.....	1355
<i>By Associate Professor Roger Fredland, U. S. Naval Academy</i>	
THE FUTURE OF THE BLIMP IN THE NAVY.....	1363
<i>By Lieutenant Commander Malcolm W. Cagle, U. S. Navy</i>	
ABEL UPSHUR, FORGOTTEN PROPHET OF THE OLD NAVY.....	1367
<i>By Dr. Donald W. Mitchell</i>	
A NEW MAP FOR STRATEGISTS.....	1377
<i>By Captain Charles A. Bond, U. S. Navy</i>	
RACIAL CHARACTERISTICS AND FIGHTING CAPACITY OF THE GERMAN.....	1381
<i>By Captain Roland E. Krause, U. S. Navy</i>	
THE WORST MARINE DISASTER IN U. S. HISTORY.....	1387
<i>By Lieutenant Commander Ralph P. Dillon, U. S. Naval Reserve</i>	
THE NAVY SEEKS BUSINESS EFFICIENCY AS WELL AS COMBAT EFFICIENCY..	1389
<i>By Commander Lamar Lee, Jr., SC, U. S. Navy</i>	
THE NEW TYPE 1950 NAUTICAL ALMANAC.....	1395
<i>By Commander Edwin A. Beito, U. S. Naval Reserve</i>	
THE AMERICAN MERCHANT MARINE IN WORLD WAR II (<i>Pictorial Section</i>)..	1403
DISCUSSIONS, COMMENTS, NOTES.....	1413
BOOK REVIEWS.....	1415
PROFESSIONAL NOTES.....	1419
SECRETARY'S NOTES.....	1437

The opinions or assertions in the articles are the private ones of the writers, and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

Published monthly at 450 Ahnaip St., Menasha, Wis.
 Executive, Editorial and Business Offices, U. S. Naval Institute, Annapolis, Md.
 Advertising Department Suite 710, 2000 Connecticut Ave., N.W., Washington, D.C.
 Entered as second-class matter at the post-office at Menasha, Wis., April 4, 1922, and at the post-office at Annapolis, Md., under Act of August 4, 1912. Acceptance for mailing at the special rate of postage provided for in section 1103, Act of October 3, 1919, authorized March 13, 1922.
 Membership dues (including PROCEEDINGS), \$2.00 a year.
 Subscription rate, \$4.00 a year. (Foreign postage, \$1.00 extra.) Single copies 50 cents.

NOW . . . CAPEHART TONE BRINGS TELEVISION TO LIFE!



Maestro WILFRED PELLETIER of Metropolitan Opera Company

Together, International Telephone and Telegraph Corporation and Capehart-Farnsworth Corporation bring you a new experience in television. For the first time, you enjoy *living sound* combined with a vivid image . . . to give you realism never before attained by any television receiver. Here is *tone* so full, so true it reproduces every shading of sound from whisper to whistle . . . from treble of flute to rumble of double-bass . . . Today, I T & T brings you Capehart television. Today, television comes to life . . . through Capehart *tone*.

IT & T

THERE'S MORE TO TELEVISION THAN MEETS THE EYE...WHEN YOU OWN A CAPEHART

INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION
New York, N. Y.

"One of the great battle histories of literature"

—HENRY STEELE COMMAGER

History of the United States Naval Operations in World War II

BY SAMUEL ELIOT MORISON

Every navy man, every reader and student of American
history needs these stirring, authoritative volumes:

NEW

THE STRUGGLE FOR GUADALCANAL

August 1942-February 1943

Devoted entirely to the campaign in which the
U.S. Navy saw more fighting than in any three
previous wars. Vol. V.

THE RISING SUN IN THE PACIFIC

1931-April 1942

Describes the "incidents" that really began the
war in the Pacific . . . Pearl Harbor . . . the
invasion of the Philippines and Java . . . the
Halsey-Doolittle raid on Tokyo. Vol. III.

THE BATTLE OF THE ATLANTIC

September 1939-May 1943

Deals with the defense of American shores,
and ships . . . gives details of all convoys and
the war on the U-boats. Vol. I.

NEW

CORAL SEA, MIDWAY AND SUBMARINE ACTIONS

May 1942-August 1942

How the Navy turned the corner from defeat
to victory in the Pacific. "I strongly recom-
mend this book, as well as its companion
volumes, to every thinking American."—
ADMIRAL LOUIS DENFELD. Vol. IV.

OPERATIONS IN NORTH AFRICAN WATERS

October 1942-May 1943

A full record of the navy side of "Operation
Torch," at its time the largest overseas expe-
dition ever undertaken. Vol. II.

Each Volume Fully Illustrated

with Photographs and Maps

At all bookstores

Each volume, \$6.00

These are Atlantic Monthly
Press Books

LITTLE, BROWN & COMPANY • 34 Beacon St., Boston 6



Courtesy LIFE. Copyright TIME, Inc.

THE RAIDER *ATLANTIS* AND HER VICTIM, THE *ZAMZAM*

(Top) Disguised as the Norwegian motorship *Tamesis*, the German commerce raider, *Schiff #16*, known as the *Atlantis*, is photographed from a victim's lifeboat.
 (Bottom) The Egyptian steamer is sinking as her lifeboats pull away. These photographs were taken by David E. Scherman, a *Life* staff photographer who happened to book passage on the ill-fated *ZamZam*.

UNITED STATES NAVAL INSTITUTE PROCEEDINGS

Vol. No. 75, No. 12

DECEMBER, 1949

Whole No. 562

THE CRUISE OF THE GERMAN RAIDER *ATLANTIS*, 1940-1941

By RICHARD S. PATTEE

THE operations of the German disguised merchant raiders or auxiliary cruisers were cloaked in such secrecy that any mention of the subject brings a rash of questions from Naval officers and laymen alike. Were there any raiders in World War II like S.M.S. *Moewe*, *Wolf*, or Count Luckner's *Seeadler* in the previous war? Where did they operate? What did they do?

The merchant raider or disguised auxiliary cruiser is the weapon of the minor sea power; the sea power which has no cruising navy and whose ocean going commerce is non-existent or has been swept from the seas. In World War II the Germans had twelve disguised merchant raiders; nine of them made eleven cruises lasting from five to twenty-one months. These raiders sank a grand total of one hundred and thirty-six war and merchant ships of 850,000 gross tons. This is the narrative of the cruise of *Schiff 16*, the *Atlantis*. Although she was the first raider to run the Allied blockade, she was not definitely identified until two other raiders were known to be at sea, and therefore she was known by the British as "Raider C" rather than "Raider A" or "B."

The *Atlantis*, or *Schiff 16*, as she was officially known, was originally the express cargo ship *Goldenfels* of the German Hansa Line. Built in 1937, she ran from Germany to Seattle until the war started in September

1939. Three days after Neville Chamberlain delivered his fateful message of failure and "peace in our time" was proved a myth, the *Goldenfels* was ordered to proceed to the Weser Yard at Bremen. There, three months later, her conversion was completed and she became Hilfskreuzer II. To all outward appearances she was still a peaceful cargo ship, but hidden behind that innocent exterior was a formidable armament: six 5.9-inch, one 3-inch, and a dozen smaller guns; twin torpedo tubes were mounted on each side amidships, and two more below the waterline. In addition she had equipment to stow and launch two seaplanes and she carried one hundred contact mines. Extra fuel and water tanks had been installed and her forward holds were fitted up as quarters for a crew of 350 men.

Even her exterior had been so altered that in a matter of hours her identity could be completely changed. By altering the height and rake of her masts and kingposts, by manipulating a canvas dummy funnel and by the extensive use of canvas screens and paint, she could change from the German *Goldenfels* to the Norwegian *Tamesis*, to the Dutch *Abbekerk* or to any of the hundred or so other ships she resembled.

The *Goldenfels* proceeded to Kiel, where on 15 December 1939, she was commissioned as *Schiff 16*, a regular warship in the German

Now a member of the senior class at Harvard University, Mr. Pattee served as an enlisted man in the Naval Reserve in 1945-46 and for the past two summers has been a research assistant to Captain Samuel Eliot Morison, USNR, who is writing the multi-volume *History of U. S. Naval Operations in World War II*. Mr. Pattee is making a thorough study of German commerce raiders in the recent war, of which the accompanying article is a part.

Navy. She did not receive her unofficial name, *Atlantis*, until after she had put to sea. Her commanding officer was Kapitän zur See Bernhard Rogge. For the next two and a half months he trained his ship and tested his crew. Then late in February he loaded fuel and stores and took on ammunition and a cargo of mines.

Schiff 16 sailed from Kiel on 11 March 1940. She passed through the Kaiser Wilhelm Canal and conducted further training operations in Helgoland Bight. During these operations in German waters *Schiff 16* was disguised as a two-funneled naval auxiliary. Altering her identity just before leaving Helgoland Bight to the Norwegian freighter *Knute Nelson* and every possible preparation having been completed, she started northwards on 31 March, moving slowly up the Norwegian coast. On 3 April she turned west and headed out to sea.

For her voyage to the north of Iceland and through the Denmark Straits she changed her identity again to the Russian naval auxiliary *Kim*. After exchanging signals with the U-37 on 4 April she broke through the Denmark Straits, depending for protection upon bad weather and the confusion created by the invasion of Norway. On 7 April Kapitän Rogge sent a radio message to the Naval Operations Staff that *Schiff 16* had successfully run the Allied blockade. She then moved down through the Atlantic, avoiding the few ships she sighted and leaving the Azores and the Cape Verdes well to the eastwards, and passed the Equator on 22 April. Realizing that the presence of a Russian ship in the South Atlantic was very unlikely, on 27 April she changed her identity still another time, this time to the Japanese freighter *Kashii Maru*.

While moving southeastwards along the Freetown-Capetown route on the morning of 5 May, she sighted an unidentified ship about 500 miles off Cape Frio, Portuguese West Africa. Although Kapitän Rogge had been ordered by the Naval Operations Staff to make no attacks until his initial mission, the mining of Capetown, had been completed, he, fearing that the ship would report the sighting, decided to attack her. Turning and coming up on the enemy's starboard quarter, he opened fire. The enemy immediately sent out an RRRR ("Attacked by enemy raider") signal, but ceased transmitting and hove to when ordered to do so. When boarded she turned out to be the British freighter *Scientist* en route from Durban via Freetown to England with a general cargo. Kapitän Rogge, after taking her crew aboard his own ship, sank *Scientist* with a torpedo.

Continuing southeastwards around the Cape of Good Hope, he turned, moved close inshore, and on the night of 10-11 May laid 94 mines off Cape Agulhas. One of the mines broke loose and washed ashore; the British, forewarned, rerouted traffic so no ships were lost on this field. Rogge then moved into the Indian Ocean to attack the shipping routes there.

Having changed his ship's disguise to that of the Dutch motor ship *Abbekerk*, Rogge selected the Australia-South Africa route as his initial operating area. His first victim in this area was the Norwegian motor ship *Tirranna*, which he captured on 10 June about 450 miles northeast of Mauritius. She was bound from Australia to Suez via Durban with military stores. Like *Scientist*, *Tirranna* sent out an RRRR signal and tried to escape, but she was shelled and forced to stop. Rogge put a prize crew aboard, and in order to leave the regular shipping route, moved southwards for twenty-four hours before heaving to. Having transferred *Tirranna's* papers to the raider and left orders for the *Tirranna* to effect repairs and wait about 800 miles to the south, Rogge moved off to the northeast towards the Malacca Straits-Colombo route, overhauling his engines as he went.

On 18 June Rogge altered his ship's identity to that of the Norwegian motor ship *Tarifa*, the disguise she was to use until the

end of December 1940. Rogge's new operating area was in the southern part of the Bay of Bengal to the southeast of Ceylon, and it was in this area that he first used his seaplane to any extent. On approaching his victims he signaled that he was a British armed merchant cruiser conducting a routine search. In this manner he sank the British ships *City of Bagdad* on 11 July and *Kemmendine* on 13 July. In each case Rogge, having received a sighting report from his seaplane, shadowed his victim for several hours, closed to about two miles, ordered her to halt and then attacked her with shellfire when she sent out an RRRR signal and attempted to escape. Having taken off the crew, he sank the ship with scuttling charges.

For his operations between 14 July and 22 July, Rogge chose the area to the south of the Chagos Archipelago on the Mauritius-Sabang route—the hunting ground of S.M.S. *Emden* during World War I. During the next ten days he moved back toward the Australia-South Africa route where on 30 July, he met *Tirranna* at the prearranged spot in the central Indian Ocean and spent the following three days in transferring fuel, stores and prisoners from *Schiff 16* to *Tirranna*. Visibility was poor on the morning of 1 August and the Norwegian freighter *Talleyrand* practically stumbled on the meeting point to be captured before she could send out a distress call. The next day Rogge transferred her crew to *Tirranna* and then sank *Talleyrand*. After sinking the *Talleyrand*, he sent *Tirranna* with a prize crew into Bordeaux.

For the next two months Rogge operated in the Mauritius-Rodriguez area, and he found the hunting excellent. On 24 August, he sank the British freighter *King City*, and on 9 September, the British tanker *Athelking*. The day after this last attack Rogge sank the British freighter *Benarty*, which had been previously located and unsuccessfully attacked by the raider's seaplane.

Schiff 16 now had too many prisoners aboard, and Rogge began to hunt for a prison ship. Late on the afternoon of 19 September, he sighted a passenger ship, and in hope of using her to carry his prisoners, he shadowed her all that night. Unfortunately, when attacked early the next morning, this

ship, the ex-French passenger ship *Commissaire Ramel*, caught fire and sank.

After sinking *Commissaire Ramel*, Rogge moved to the west at slow speed, overhauling his ship's engines as he went. Pressed by his need for a prison ship even more than before, he hoped to find one off the Sunda Straits. Fortunately for him, on 22 October his communications section intercepted a message from the Yugoslav freighter *Durmilor* to her agents. Rogge immediately approached the freighter's estimated position and launched his seaplane. After the seaplane had sighted the *Durmilor*, he closed and captured her without resistance. He used the excuse that there was contraband in the cargo and put a prize crew of two officers and twelve men aboard with orders to meet him about 200 miles south of Christmas Island on 26 October. After proceeding separately to the rendezvous point, the two ships met and Rogge transferred 264 prisoners to *Durmilor* which was then ordered to Mogadishu, Italian Somaliland.

Rogge, freed of the encumbrance of his prisoners, moved northwestward. During the afternoon of 7 November, the raider's seaplane, which was sent out on searches twice a day, sighted a tanker. Rogge made contact early the next morning. Working up to full speed, he closed and signaled, "What ship?" "Teddy, Oslo; Who are you?" came the answer. "Armed merchant cruiser H.M.S. *Antenor*, heave to and be searched," signaled Kapitan Rogge. *Teddy* stopped, and a prize crew boarded her without resistance. Informed that she was en route from Abadan to Singapore, with a cargo of fuel oil, Rogge detached her with orders to meet him later at "Pt. Mangrove" which was off Christmas Island.

"Pt. Mangrove" was a code name for a prearranged position of exact longitude and latitude. The Germans used code names for all routes (colors), meeting points (usually common given names or historical names), and waiting areas. For example the South Atlantic waiting area was "Komponisten" (composers), and the meeting points within the area were named Wagner, Gluck, Mozart, etc.

Two days later Rogge tried the same ruse,



SCHIFF 16—THE GERMAN RAIDER ATLANTIS

Credited with sinking sixteen ships and capturing six others, this raider used aircraft for spotting her victims. Her seaplane is shown on the No. 2 hatch in the picture above.

but on this occasion it failed. This time his victim, the Norwegian tanker *Ole Jacob* laden with 110,000 barrels of aviation gasoline, was suspicious, sent out an RRRR signal, and then reported being stopped by an armed merchant cruiser. Kapitan Rogge had both messages cancelled in plain code, put a prize crew aboard her and then detached her with orders to meet him on 15 November off Christmas Island. Just after daybreak the following morning, 11 November, when *Ole Jacob* was hardly over the horizon, Kapitan Rogge attacked and sank the British freighter *Automedon*. *Automedon* had picked up *Ole Jacob's* radio signals and she refused to heave to until crippled by the raider's shellfire.

Rogge quite correctly calculated that the British would conduct an extensive search, since he had sunk three ships in the same small area within four days, so he moved to the southwest toward the Sundra Straits where he arrived early on the morning of 13 November. There he met and refueled from his prize, the tanker *Teddy*, after which she was sunk. The next day the raider met *Ole Jacob* and kept her in company until 19 November, when she was ordered to Japan.

On 23 November, Rogge received a message from the Naval Operations Staff which ordered him to remain north of latitude 30 South, from 25 November until 15 December, so that *Schiff 16* would not interfere

with the operations of the raider *Penguin* (*Schiff 33*). *Penguin* was expected to move into the area below, to the south of 30 South, after laying mines in Australian waters. Later he was ordered to meet the *Penguin* and her prize, the tanker *Storstadt*. On 10 December *Schiff 16* refueled from and provided a prize crew for *Storstadt*.

It is interesting to observe the close control that the German Naval Staff kept over these raiders, a control that was developed to an even greater extent with the second group of raiders. During World War I the raiders had strict orders not to break radio silence, but the German Naval Staff devised a system whereby all the alternatives would be lettered or numbered and the raider could acknowledge receipt by merely repeating a single letter for ten or fifteen seconds.

Following his instructions Rogge then moved southward, arriving on 14 December at Gazelle Bay in the Kerguelen Islands, which are an uninhabited French possession in the southern part of the Indian Ocean, an almost perfect place for overhaul. From 15 December 1940 to January 1941, engines were overhauled, water supply replenished and the raider's hull scraped and painted, altering her identity to that of the Norwegian motorship *Tamesis*.

Refitting completed, Rogge took his ship north to operate at the northern end of the Mozambique Channel, off the Seychelles

Islands. During the morning of 24 January, the raider's seaplane sighted a freighter and, swooping low, carried away the freighter's aerials with a specially designed grapple; this is the first reported use of a raider's plane in this manner, but the technique was used extensively later by the commanding officers of raiders *Thor* (*Schiff 10*) and *Michel* (*Schiff 28*). Rogge's victim was *Mandasor* of the British India Steam Navigation Company, bound from England to India with military equipment. She was badly damaged and that same evening was sunk with time bombs. Three days later the Germans had the rare and most frustrating privilege of watching RMS *Queen Mary* pass across the horizon. The mighty "*Queen*" was bound from Bombay to Mombasa with a load of Indian troops. She never came within range and her speed, almost twice that of *Schiff 16*, undoubtedly would have enabled her to escape had she done so. Rogge's next successful attack was on the British freighter *Speybank*, which he captured to the northwest of the Seychelles on 31 January. Kapitan Rogge kept this vessel in company and two days later, just to the southeast, he captured the Norwegian tanker *Kelty Brovig*, bound from Bahrein to Lourenço Marques and laden with 4000 tons of diesel oil. The day before Rogge had sighted and had been sighted by the British Blue Funnel liner *Troilus*. The *Troilus*, forewarned by the RRRR warning that the *Mandasor* had sent out on an emergency aerial, never allowed the range to close and sent out a raider warning. That night the two ships broke off the contact by mutual consent.

Rogge had previously received orders from the Naval Operations Staff to remain in the western sector of the Indian Ocean, north of latitude 60 South until 15 February, so that a meeting with the pocket-battleship *Admiral Scheer* could be arranged. On 2 February, he reported the capture of *Kelty Brovig* and suggested that her cargo might be used to refuel *Admiral Scheer* at a meeting point west of Madagascar. The Naval Operations Staff ordered Rogge to wait with *Kelty Brovig* southeast of the Seychelles, until 12 February.

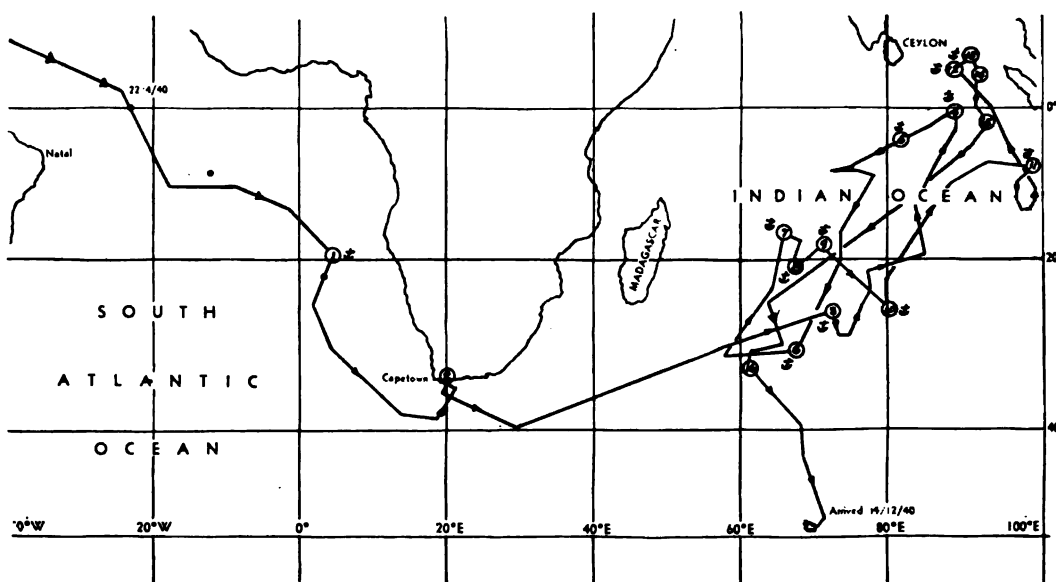
Rogge met *Kelty Brovig* and refueled his ship on 12 February, and the following day

the three ships, *Schiff 16*, the tanker *Kelty Brovig* and the freighter *Speybank*, were joined by the German freighter *Tannenfels* from Kismayu, Italian Somaliland, with the prize crew of *Durmitor*.

Rogge received radio orders directly from *Admiral Scheer* to rendezvous southeast of Saya de Malha Bank on 14 February. The pocket-battleship was met just after mid-day on 14 February and Rogge went aboard for a conference, but the weather was too bad for refueling or supply operations; in fact, the Mauritius radio broadcast a hurricane warning later that afternoon. The five ships, *Admiral Scheer*, *Tannenfels*, *Schiff 16* and her prizes, *Speybank* and *Kelty Brovig*, headed northwards to get out of the bad weather area. That same night *Tannenfels* was detached as there was no longer need for a prison ship. At daybreak on 15 February, the *Admiral Scheer*, *Schiff 16* and the *Speybank* rendezvoused, but the *Kelty Brovig* did not join, and the search organized to find her was unsuccessful until 16 February.

Kapitan Rogge had reported to Kapitan Krancke, the commanding officer of the *Admiral Scheer*, that the area to the north of Madagascar was a suitable zone of operations for the pocket-battleship. They decided that while the *Admiral Scheer* was operating in that area, *Schiff 16* would move to the east of the Seychelles to intercept any ships which might be forced to take the passage to the east of Madagascar by the presence of the pocket-battleship in the Mozambique Channel. This type of strategic cooperation between a regular warship and an auxiliary cruiser had been used before by the *Admiral Scheer*; in this case, however, *Schiff 16* was also to cover the refueling operations of the tenders and to guard any prizes the pocket-battleship might take.

Rogge was ordered to rendezvous with the German tanker *Uckermark* which had left Kismayu on 11 February, but the two ships never met. Rogge sighted no Allied ships, although early on the evening of 20 February, just after he had detached the *Speybank*, he did sight two Vichy French submarines, *Pegase* and *Monge*, which with their tender, *Lol*, were on their way from Diego Suarez to Dakar; but, since they had received permission for this trip from the Ger-



PROGRESS OF THE ATLANTIS—APRIL 22 TO DECEMBER 14, 1940

(1) *Scientist* sunk, May 5; (2) Cape Agulhas mined, May 10–11; (3) *Tiranna* captured, June 10; (4) *City of Bagdad* sunk, July 11; (5) *Kemmendine* sunk, July 13; (6) *Talleyrand* sunk, Aug. 1; (7) *King City* sunk, Aug. 24; (8) *Athelking* sunk, Sept. 9; (9) *Benarty* sunk, Sept. 10; (10) *Comm. Ramel* sunk, Sept. 19; (11) *Durmitor* captured, Oct. 22; (12) *Teddy* captured, Nov. 7; (13) *Ole Jacob* captured, Nov. 10; (14) *Automedon* sunk, Nov. 11; (15) Rendezvous with *Pinguin* (Schiff 33) and *Storstadt*, Dec. 12.

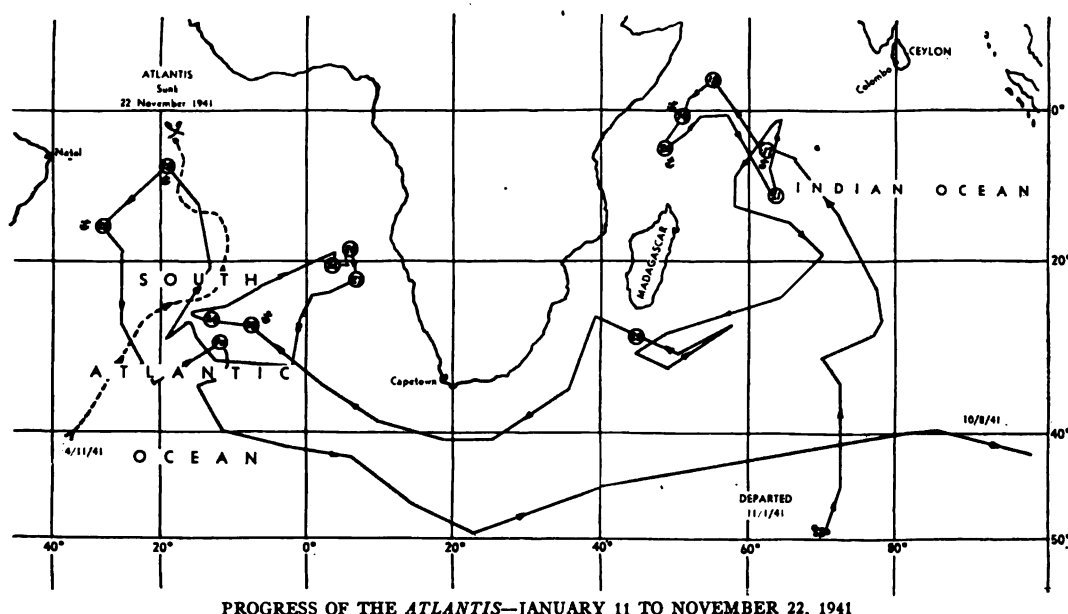
man Armistice Commission, they were allowed to pass unmolested. The next day, 21 February, the Japanese freighter *Africa Maru* was sighted and also allowed to pass.

Early on the morning of 24 February, Rogge radioed the *Admiral Scheer* that he had not met *Uckermark* and that he was planning to rendezvous with the pocket battleship on 25 February. This meeting never took place either as the two commanding officers had confused the rendezvous points. Although Krancke could not remain in the area any longer, he did detach his prize, the tanker *British Advocate*, with instructions to meet *Schiff 16*. Rogge moved southward and met *British Advocate* on 28 February. He supplied the tanker for her voyage in to the French coast and detached her the following day. That same day he met and refueled from the *Kelly Brovig* and then detached her with orders to wait to the east of Madagascar. This operation concluded the strategic and tactical cooperation between *Schiff 16* and the *Admiral Scheer*. On 2 March he met *Speybank* to the south of the Chagos Archipelago, detached her to wait

about 550 miles to the southeast of Reunion Island and then followed her south.

On 8 March the Naval Operations Staff broadcast instructions to all of the auxiliary cruisers and their tenders. There were several proposed meetings, but the only definite orders for *Schiff 16* were to rendezvous with the raider *Pinguin* (Schiff 33) about 550 miles south of Madagascar and report the fuel reserves of each ship, after which *Schiff 16* was to proceed to the South Atlantic. Before receiving these orders, Rogge had met *Pinguin* so he cruised back and forth in the area to the south and southeast of Madagascar for two weeks. The only ship sighted was a neutral, early on the morning of 10 March, moving southwestward with running lights set. Just before dawn on 14 March, he met *Speybank* again and the two ships stayed in company for seven days. Then he transferred his prisoners to *Speybank* and sent her into Bordeaux on 21 March.

His next operation was the refueling of the Italian submarine *Perla*, the sole survivor of the Italian Red Sea Submarine Flotilla, which he met about 200 miles south of Cape



(17) *Mandasor* sunk, Jan. 24; (18) R.M.S. *Queen Mary* sighted, Jan. 27; (19) *Speybank* captured, Jan. 31; (20) *Kelly Brovig* captured, Feb. 2; (21) Rendezvous with *Kelly Brovig*, *Speybank*, *Tannenfels*, and *Admiral Scheer*, Feb. 12-19; (22) Rendezvous with *Perla*, March 28-April 1; (23) *Zam Zam* sunk, April 17; (24) Rendezvous with *Kormoran* (*Schiff 41*), *Nordmark* and *Alsterufer*, April 18-25; (25) *Rabaul* sunk, May 14; (26) H.M.S. *Nelson* and H.M.S. *Eagle* sighted, May 17; (27) *Trafalgar* sunk, May 24; (28) *Tottenham* sunk, June 17; (29) *Balsac* sunk, June 22; (30) Rendezvous with *Orion* (*Schiff 36*) July 1-6. The course of *Atlantis* from November 4-22 is represented by a dotted line as her exact daily position was in the section of her log that was lost when she was sunk by H.M.S. *Devonshire* on November 22, 1941.

Dauphin, Madagascar, and remained in company from 28 March to 2 April when the submarine was detached. *Perla* was to operate at the southern end of the Mozambique Channel, while *Schiff 16* proceeded to the South Atlantic. On the afternoon of 5 April, during the passage to the South Atlantic, Rogge stopped the French freighter *Chenonceaux*, but allowed her to proceed on her passage to Dakar. He rounded the Cape of Good Hope and moved into the waiting and rendezvous-area in mid-South Atlantic. On 13 April, he met the supply ship *Dresden* which had left Santos on 28 March. The two ships moved slowly eastward in company for the next three days, the raider receiving supplies from *Dresden* during the afternoon of 16 April before Rogge temporarily detached her. Rogge feared that he might be surprised while refueling as his radio interception staff had picked up a QQQQ ("sighted suspicious ship") report from the Norwegian freighter *Tai Yin*. As no other German raider was near by, Rogge feared

that a British patrol vessel in the vicinity had stopped *Tai Yin* and that the patrol vessel had been mistaken for a German ship.

There was a bright moon that night, and at about 0400, an unidentified ship was sighted at a range of almost ten miles. The raider closed this vessel observing that she had four masts and the single tall, thin funnel of a Bibby liner. The vessel, in sight closely resembled the Bibby liner *Oxfordshire*, which was known to be an armed merchant cruiser, and this resemblance combined with the radio intercept from the *Tai Yin* would fully have justified Rogge's making off at top speed. Nevertheless, he decided to attack. His ship had made no sinkings for seventy-four days. Also, less than two weeks before, the German raider *Thor* (*Schiff 10*) had surprised and sunk a British armed merchant cruiser, H.M.S. *Voltaire*.

Rogge shadowed his unsuspecting victim for almost three hours before opening fire at 0625. The range had closed to just under three miles when the German ship attacked

her enemy from the starboard quarter. The merchant ship made no effort to use her radio, but did attempt an escape before finally heaving to and signaling that she was the neutral Egyptian steamer *Zam Zam* bound from New York and Baltimore to Suez via Trinidad, Pernambuco and Capetown.

Now Rogge was faced with a difficult problem, for the *Zam Zam*, besides her crew of 110, had 217 passengers aboard, including 77 women and 38 children. Moreover, 137 of the passengers were Americans—missionaries bound for their posts in Africa, ambulance drivers of the American Field Service bound for service in the Western Desert with the British Eighth Army, and *Time-Life* correspondent Charles J. V. Murphey and his photographer David E. Scherman. The *Zam Zam* was sinking and Rogge had no choice but to take the passengers and crew aboard *Schiff 16*. Making the best of a bad situation the Germans stripped *Zam Zam* of her stores and expedited her sinking with scuttling charges late that afternoon.

Rogge called up *Dresden*, met her the next day, transferred all of the prisoners to *Dresden* and ordered her to stand by until he communicated with the Naval Operations Staff for instructions. Rogge returned and released *Dresden* on 26 April, with orders to stop a neutral ship and transfer her prisoners or to take them to Teneriffe or some other Spanish port. But these orders were later countermanded by the Naval Operations Staff and *Dresden* was ordered to run the Allied blockade. She finally reached Bordeaux and the Americans were returned to the United States via Lisbon.

In between meetings with *Dresden*, from 18 to 26 April, Kapitan Rogge had met the raider *Kormoran* (*Schiff 41*), the supply ship *Alsterufer* and the fleet tanker *Nordmark*. *Alsterufer* provided the two raiders with stores and additional men, while *Nordmark* refueled them. In addition *Schiff 16* received two Heinkel 114 seaplanes and a number of torpedoes from *Nordmark*. On 24 April *Kormoran* parted company and *Alsterufer* and *Nordmark* were detached to stand by while *Schiff 16* returned to release *Dresden*.

After detaching *Dresden*, Rogge rejoined and *Alsterufer* was ordered to stand by in the

waiting area, until 25 May, while *Nordmark* was to proceed northward and rendezvous with U-106, which was carrying new codes for *Schiff 16*. Then the raider moved eastward and on 4 May met the supply ship *Babilonga*. As *Schiff 16* had just been refueled and supplied, Rogge ordered *Babilonga* to stand by in the waiting area until 3 June.

Rogge changed his ship's disguise, as within a few days the prisoners from *Zam Zam* would be released and would report to the world that a German raider was disguised as the Norwegian motor ship *Tamesis*. Therefore, on 30 April, *Schiff 16* adopted the identity of the Dutch motor ship *Brastagi*.

On 7 May Rogge stopped the Vichy French freighter *Lieutenant De La Tour*, but allowed her to proceed after he had searched her. He continued to move eastward and about 200 miles off Cape Frio, Portuguese West Africa, just after midnight on 14 May, attacked and sank the British freighter *Rabaul*, bound from England to Capetown with a load of coal.

Since *Rabaul* had been unable to send out a raider warning, Rogge continued to operate on the Freetown-Capetown route. Here his ship's luck almost ran out, for shortly after midnight of 17 May the British battleship H.M.S. *Nelson* and the aircraft carrier H.M.S. *Eagle*, which were conducting an anti-raider sweep along the Capetown-Freetown shipping route, were sighted. It was a moonless night and the weather was unsettled, so he was able to make off without being seen.

Rogge moved southward, and during the afternoon of 21 May, his seaplane sighted a freighter. He intercepted her and she proved to be the Greek freighter *M. E. Kulikundis* under charter to the Swiss Government. She was sailing from Madras to Lisbon and was allowed to proceed after being searched and warned not to report the meeting or to use her radio. Two nights later Rogge saw a lighted ship, the American tanker *Charles E. Crampton*, and avoided her. During the afternoon of 24 May, the seaplane sighted the British freighter *Trafalgar* which Rogge sank late that night after shadowing her for several hours and before she could send out any raider warning.

From 25 May to 7 June, Rogge communicated by radio with *Babitonga* and arranged later meetings with the tankers *Egerland* and *Esso Hamburg*, two of the ships originally intended as tenders for the battleship *Bismarck*; however, both tankers were intercepted by the British. In addition, the substitute tanker *Lotheringen* was sunk and finally the *Babitonga* herself was intercepted.

About 250 miles northwest of Ascension Island, on 17 June, Rogge shelled and sank *Tottenham*, a new British freighter, bound from England to Alexandria with military equipment. After this attack, Kapitan Rogge moved southwestward toward South America and operated along the Freetown-La Plata shipping route. Here, just before dawn on 22 June, when the raider was about 300 miles off Recife, he attacked and sank the British freighter *Balsac*. The freighter, which was bound from Rangoon to Liverpool, sent out an RRRR signal, but was shelled into submission and sunk with scuttling charges.

Rogge had been informed by the Naval Operations staff that a meeting with the *Orion* (*Schiff 36*) would be arranged early in June. On 23 June, *Orion* reported that she would be at the meeting point just south of Tristan da Cunha, on 1 July. Because of the loss of the tankers *Egerland*, *Esso Hamburg* and *Lotheringen*, *Schiff 16* would have to divide her fuel supply with *Orion*. The future operational plans for the two raiders were sent out by the Naval Operations Staff on 30 June. The orders were: 1) One of the raiders in the South Atlantic would have to move to another area—*Schiff 16* would be best since she had more fuel; 2) The raider that shifted her operational area would either round the Cape of Good Hope and operate off Western Australia, or, 3) round Cape Horn and after meeting the supply ship *Anneliese Essberger*, operate in the South Pacific until November. This ship would then return to the South Atlantic and serve as a supply ship for the U-boats which would then be operating in that area. After refueling the U-boats, the raider would return to the French coast at the end of 1941.

Rogge met *Orion* on 1 July and they remained in company for five days. Arranging the two ship's respective operating areas with Kapitan zur See Kurt Weyher, com-

mander of *Orion*, *Schiff 16* refueled *Orion* and then they parted company. However, these arrangements were countermanded by the Naval Operations Staff on 10 July. *Schiff 16* was to shift her operating area to the Indian Ocean and to remain south of latitude 25 South so as to leave the northern Indian Ocean free for the operations of *Kormoran* (*Schiff 41*).

Rogge rounded the Cape of Good Hope and moved almost directly across the southern part of the Indian Ocean without sighting any ships although he sent his seaplane on daily searches. He steered well to the south of Australia and New Zealand and entered the Pacific on 14 August, then moved northward to operate on the New Zealand-Panama route in the vicinity of the Tonga Islands. Just after daybreak on 10 September, two days after his arrival in his assigned operating area, he captured the Norwegian motor ship *Silvaplana*, bound Batavia to New York with a valuable cargo of spices and quinine bark. He moved northeastward, after ordering *Silvaplana* to wait in the area to the south of the Marquesas Islands until 14 September.

The Naval Operations Staff had arranged a meeting for *Schiff 16* and the supply ship *Munsterland* and possibly the raider *Komet* (*Schiff 45*) during the later part of September. *Komet* had been operating off the Pacific entrance to the Panama Canal and was moving westward in company with her prize, the Dutch freighter *Kota Nopan*.

Rogge, cruising back and forth across the New Zealand-Panama route, moved steadily eastward in order to reach the assigned rendezvous with the *Munsterland* and *Komet*. He detached the *Silvaplana* on 18 September, with orders to stand by, while he continued eastward. On the morning of 21 September, he met *Komet* and her prize *Kota Nopan* and on the following day met the *Munsterland*. Rogge took all of the *Munsterland*'s stores and fuel for *Schiff 16* as the *Komet* had refueled from the supply ship *Anneliese Essberger* shortly before. The next day Rogge transferred his prisoners to the *Munsterland* and *Kota Nopan* and then parted company with *Komet* and her prize. They were to proceed to the South Atlantic while he moved southward with *Munsterland* to meet *Silvaplana*.

On 28 September *Silvaplana* was refueled and supplied by *Munsterland* and on the following day he sent them to Bordeaux and Japan respectively.

Having completed his scheduled refueling and supplying operations in the Pacific, Rogge moved southeastward toward Cape Horn. Before he rounded the Cape on 27 October, the Naval Operations Staff asked him if he could refuel the U-68 at a meeting point just to the west of St. Helena between 12 and 15 November. He answered that he would reach the meeting point by 13 November.

Passing Cape Horn, he moved northward into the center of the South Atlantic, passing well to the south and east of the Falkland Islands and met the U-68 on 13 November and then parted company two days later. On 17 November Kapitan Rogge changed the identity of *Schiff 16* to that of the Dutch motor ship *Polyphemus* and after assuming this new disguise, continued northward to meet the U-126 about 350 miles northwest of Ascension Island. At dawn on 22 November, the U-126 was sighted and Rogge hove to in order to start refueling her.

At 0815 Rogge sighted a ship, and three minutes later she was definitely identified as an English heavy cruiser of the "County" class. *Schiff 16* turned a complete circle to starboard and made off to the southeast. The enemy opened fire at 0830, but Rogge held fire, hoping either to use his disguise as the Dutch *Polyphemus* or to draw the British cruiser into a position where the U-126 could torpedo her. At 0840 he sent out an RRRR signal: "RRR RRR de *Polyphemus*—4 20 South, 18 35 West—0940 GMT." The English cruiser checked her fire for almost an hour, but at 0930 she opened fire again. *Schiff 16* was hit repeatedly and was set on fire aft. At 0958 Rogge gave the order to abandon ship and the crew went over the side. The boats lay by, and the crew gave three cheers for the *Atlantis* as she blew up and sank at 1015.

Perhaps a clearer picture of the sinking of *Schiff 16*, the *Atlantis*, is given in a British report of the action.

On 22 November the heavy cruiser H.M.S. *Devonshire* (Captain R. D. Oliver, D.S.C., R.N.), patrolling the Cape Verde-Capetown shipping route, was a little over 350 miles

northwest of Ascension Island. At daybreak the cruiser flew off her seaplane for a routine anti-submarine and surface search ahead. The plane returned a little after 0700 and reported an unidentified merchant vessel about 40 miles away. The *Devonshire* closed this position at 25 knots and at about 0800 sighted masts. Twenty minutes later the cruiser flew off her other seaplane and closed to between 7 and 11 miles range. *Schiff 16*, for this unidentified merchant vessel was the German raider, turned a complete circle to starboard and made off to the southeast. At 0840, in order to provoke a return fire, the *Devonshire* fired two salvos, spread to the right and left. *Schiff 16* stopped and sent out the radio signal, "RRR RRR de *Polyphemus*—4 20 South, 18 35 West—0940 GMT."

Suspicion was aroused by the fact that the RRR letters were sent out in groups of three instead of four; nevertheless, the *Devonshire* signaled to Senior Officer South Atlantic at 0900, asking the whereabouts of the *Polyphemus*. At about 0930 the cruiser signaled her plane which was hovering over *Schiff 16*, asking the type of stern the "merchant" vessel had. "Like *Tamesis*," the plane replied—the *Tamesis* was the alias that *Schiff 16* had used when she sank the *Zam Zam*. A couple of minutes later the answer came from the Senior Officer South Atlantic—"No, Repetition No!"

The *Devonshire* immediately opened at a range of 10 miles and scored. *Schiff 16* made smoke, but made no attempt to return fire. Within ten minutes the *Devonshire* had fired thirty salvos, the target was obscured by smoke, and the cruiser turned eastward to clear the line of vision. The cruiser's plane reported that *Schiff 16* was still making 15 knots and the *Devonshire* opened fire again. Captain Oliver felt that the enemy was attempting to draw him southeastward, possibly into a submarine trap, so he checked direction. *Schiff 16* was on fire and down by the stern. Just after 1000, there was an explosion, ten minutes later another, and at 1016, *Schiff 16*, the *Atlantis*, sank.

Half an hour later *Devonshire* picked up her plane, which reported that there was a U-boat present. The cruiser made off, as any attempt to pick up survivors would have

been suicidal.

The submarine, the U-126, which *Schiff 16* had been refueling, took care of the survivors. Rogge had the U-boat tow the sunken raider's boats for two days, after which they were picked up by the submarine supply ship *Python*, which was operating off St. Helena. The *Python*, however, was intercepted and sunk by H.M.S. *Dorsetshire* on 1 December, to the south of St. Helena. The four hundred survivors—only seven men were lost in the sinking of *Schiff 16* and none in the sinking of *Python*—were again picked up by the accompanying U-boats, U-68, U-124 and U-A. Each took aboard fifty men and carried the rest on deck in life rafts, so that in case of

danger the submarine could submerge and let the life rafts float free. In this manner all the survivors reached Bordeaux between 25 December and 3 January 1942.

Schiff 16, the *Atlantis*, under the command of Kapitan zur See Bernhard Rogge, had cruised in enemy waters for almost twenty-one months. She had circumnavigated the globe and operated in every ocean. Rogge had sunk 16 ships of 106,227 tons and captured 6 more of 38,137 tons, a total of 22 ships of 144,364 gross tons. Truly a modern Sir Francis Drake in a modern *Golden Hind*, he must be credited with conducting a voyage second to very few in the long dramatic history of the sea.



BEMUSED

Contributed by CAPTAIN FREDERICK L. OLIVER, U. S. Navy (Retired)

In 1904 when the Navy was undergoing its renaissance in target practice procedure, U.S.S. *Texas* held an experimental firing with one of its antiquated howitzer-like 30 caliber 6-inch guns at the then unprecedented range of 4000 yards.

As the first shell, trailing a wake of dense black tracer smoke, streaked skyward to an enormous height, a startled bluejacket onlooker turned away with a disgusted, "Way over."

While his back was turned, the shell plunged down and by some odd quirk landed on the target, bringing forth exclamations of excited comment.

The scoffer, nonplussed by this denouement, ejaculated, "That shell was going out of sight, how'd it get back to the target?"

A NEAR MISS

Contributed by CAPTAIN J. W. ELLICOTT, U. S. Navy

During a summer in the early nineties a fleet war game was held at Newport, R. I., in connection with War College studies. A Red Fleet (our North Atlantic Squadron) was to attempt to enter the harbor at night, *a la* Dewey at Manila Bay, defended by the army harbor defences and a group of submarines.

The day before the exercise a lieutenant commanding one of the submarines lunched with the signal officer of Battleship *X* and they discussed profiles of our battleships which could identify them at night *en silhouette*.

"I can pick out the *X* from the whole bunch," said the submariner. "I'll put two torpedoes into her tonight."

"I'll bet a ten spot you can't do it," replied the signal officer, and the bets were posted.

The submariner snooped all over the combat area that night, almost overlooking other opportunities, until he discovered the *X* close to the harbor entrance and headed in. He theoretically fired two torpedoes at point blank range, then surfaced and ran alongside to hail the bridge.

"I've put two torpedoes into you," he called up.

"No you haven't," a familiar voice called down to him. "We've already been sunk."

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS.)



Photograph Courtesy of Green Studio

AN AMERICAN-BUILT SHIP, BUT A FOREIGN FLAG
This former Liberty ship, now under the Spanish flag, delivers foreign ore in an American port in direct competition with ships under the U. S. flag.

CAN WE AFFORD IT?

By CAPTAIN E. B. PERRY, U. S. Navy, Retired

BE YOU an admiral, lieutenant, chief or a freshly caught youngster, you have a budget. You may never have thought of it as such and will scoff at the idea of any such mathematical precision on your part. There is just so much money coming in; the needs which must be met will cost so much; and it is up to the good wife to see to it that the two shall not be too far apart. Furthermore, regardless of your present status, you are headed for retirement or separation from the Navy. That is just as sure as death and taxes, and both are only too sure, particularly taxes. You may make a dignified exit on the shoulders of six stalwart seamen or, more prosaically, find yourself on the list of those separated from the Active List of the Navy prior to that longest cruise of all. In the Navy you will be remembered as Wild Bill, Juggy, Windy, Squeeky, Smiling or Sundowner So-and-So.

You will find yourself looking back over the years in the "Good Old Navy," when the Navy was a Navy, and confronting instead the future to be spent in an alien world of civilians. Your viewpoint will change from that of what is best for the good and glory of the Navy (known as *esprit de corps*) to that of what is necessary for you, yourself; for your family and for the good of the land which you have served, ego somewhat displacing corps. Your thinking will be less in terms of the nation's foreign problems; you will be troubled with the more pressing problems of your own immediate needs and the welfare of the nation as Our Country. You will be urged to elevate your viewpoint above national considerations and to think of this world as one vast Brotherhood but, bred in the bone, you will find it difficult to sublimate your once so-prized Red, White and Blue viewpoint to any other color or combination of colors no matter how cleverly

The opinions or assertions contained herein are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or naval service at large.

blended. To you, the Stars and Stripes will continue to be an emblem and the ONE DOLLAR on the face of a greenback will stand for guaranteed value, backed up by all of the honor and integrity of the United States of America.

One year ago, \$5.69 would buy you a ride from Washington, D.C. to New York City. Today that same convenience costs you \$7.75—and the shadow of a future increase is before us. Are we taking a ride or being taken for a ride? What has happened to the value of our dollar? When you become a civilian, you hand over cash for that ride, not a paper transportation request. It is your money, coin which you like to jingle in your own pocket, which goes to make up the present 36 per cent increase in the cost of the journey. The next increase in the cost of transportation will diminish the merriment of the pocket jingle. If your dollars come from retired pay only, they prove to be pitifully few and are not increased in numbers every few months as are the take-home dollars of so many of the so-called working trades. Service pay is becoming increasingly less attractive as compared with the wages of civilian labor, and the intangibles, such as hospitalization and retirement benefits, are no longer peculiar to the Services. Service pay requires a specific Act of Congress, whereas the increase in pay of the workers just requires action.

Those people who are in the military services or who are dependent upon Federal salaries are neglectful of, or uneducated to,

COMMISSIONED in the Regular Navy shortly after the First World War, Captain Perry served through various grades and duties until his retirement in 1946. Much of his service was in connection with shipbuilding, inspection, and operation. As Marine Superintendent of a steamship company in civil life he met experiences in buying, reconditioning, and operating American-built merchant vessels under the American flag.

the present trend in the civilian and business world. Actually, they should be the most concerned, for the round of increases in salaries and pay for any given job or position comes to them but once in a generation, not as the increased benefits of various sorts come to the members of the trades unions, about once a year, just like Christmas. As individuals, the military share the costs, direct and indirect. As heads of families they help hold the props under the elevated costs of farm products, pay more and more for Junior's shoes, and carry their load of all of our vaunted national well-being. As taxes increase, their take-home dollars just naturally shrink. We all have a real stake in this matter of increasing wages, costs, and monies in circulation.

A few facts as to money matters in the world of civilians are illuminating, although they may not be too bright. Considering the Philadelphia area as a fair example, let us see what labor, should we need it, would cost us under the highly organized setup of the Building Trades. Are you surprised to learn that it would cost you over \$4 an hour for each carpenter of a group that you would employ, and that you would be required to employ a supervisor at a higher rate to guide their efforts? Should your project require other than purely carpentry work—and practically every job does—you would also be required to call in labor in the other associated trades at correspondingly high rates, with costly supervision for each and every trade employed. It is then that you become acquainted with the term "featherbedding," a practice which is frowned upon by many good men in the very unions which promote and sanction it.

What is featherbedding? It is a means of manufacturing employment where none existed before and of making available more take-home dollars in the cost of a job. Examples might be a limitation, self-imposed, as to the number of bricks that a bricklayer would be allowed to handle in his workday; the requirement of so many carpenters and millwrights to each gang of machinists engaged on a construction job; a prohibition of the use of certain of the modern power driven tools on the job, requiring the work to be accomplished by the slower and more

costly hand methods; a requirement that all pipe up to a certain size be bent on the job rather than in a shop well equipped for pipe bending; overtime for a marine fireman when he assists in the necessary and routine blowing of boiler tubes and various other jurisdictional devices which require more trades and time on the job. When your service station installs a complete new set of spark plugs in your car to correct the one that was missing, that is featherbedding in lieu of a stronger word. Pay for time not worked and during which the employee was not even at the site of the job might be listed under this heading. Featherbedding is the brazen art of getting something for nothing; added payments without extra effort, loading the job with excess personnel. Featherbedding is the production of work and a foe to production. Most honest labor leaders, business agents, and workmen deplore the increasing tendency towards featherbedding, but featherbedding is now a well established practice and the technique is being improved daily. It slows down a job, costs the employer more money and, since it is not money earned by the sweat of the brow, is truly good for no one, least of all the ultimate consumer. Even the take-home dollars, by virtue of their having been increased in numbers, tend to shrink in their value. As one trade increases its weekly take, the other trades naturally feel that they, too, must receive more folding money—and demand follows demand.

Then there are the frequent work stoppages. The work stops, but the wages continue in most cases. Many of the stoppages are not due to any quarrel between the employer and the employee; rather they are between two or more of the crafts; jurisdictional disputes as to who will do what, generally very petty in nature but for which each union steward will fight to the limit of the job's resources. Each union's rule book states the type of work which must be handled by its craft but, unfortunately, the rule books of the various unions were not written under one supervision and have not been brought into agreement. Perhaps, like the Rules of the Road, they have purposely been left somewhat loose to allow for development. Does an iron worker do this, or

is it the job of the boilermaker; should the boilermaker tighten the nut on the bolt, or is it the job of the pipefitter? That sounds picayunish, and is, but it costs the job money. Such practices do not help the value of the dollar in getting a job done.

Today we are advised that increased production is the cure for inflation and for many of our present ills. Surely it seems reasonable that the more we shall be able to coax out of the soil; the more yards of cloth that we may be able to convert from the flower of the cotton; the more milk and butter fat that we can drain from Bossie; and the more homes that we can erect—all these do increase our national wealth in the real needs and comforts of life—provided that they are obtainable, once created. Perhaps some of us may remember when, not so long ago, we were authoritatively advised that it was essential to our well-being that we should not plow or sow the lands and that growing crops and cute little pigs should be plowed under, and it may tend to confuse our thinking. There was a time when increased production led to a lessened cost, but that is not often true today. It is seldom that the increased production of today does come at a lessened labor cost. Artificial props, guaranteed by your tax dollars, hold up the costs of many products. The iron and steel industries claim the greatest production in all of our history, but just you try to buy a hundred feet of two-inch pipe. The Government threatens to go into the steel business if production is not further increased, and business sees a framework for the nationalization of all heavy industry. Production in units or tons is one thing and production per man-day is quite something else. Actually, production per man-day has not increased in many fields; rather it has declined. Talk of a thirty hour workweek gets louder week by week. As seamen we are familiar with the stevedoring industry. It has had the advantage of more and more mechanization; better and better equipment has been provided for the quick and easy handling of loads. The wages of the stevedores are in the upper brackets. Today less tons are being handled per man-day than heretofore, and the trend is towards a compulsory lesser weight load per sling. The stevedoring trade is not outstanding in

this respect; our United States flag ships are said to be so costly to operate that there has been served notice that it will be necessary for this Government to send aid to foreign lands in foreign bottoms. We can not afford to pay the freight in ships under American register. The problem is interesting and typical of the times. We may have to send our aid to foreign countries in foreign bottoms—ships which we have contributed in whole or in part—and we will pay the freight to those nations which we are in the process of aiding while our own ships stand idle. There is logic behind such a decision. Should we continue to send at least half of our gifts in ships under the American flag, at the higher rates involved, we would in effect be subsidizing our own shipping with funds which we have earmarked and promised would be devoted to foreign aid. So long as our ships shall be well employed with demand for men to man the ships and go to sea, just so long will there be demands which will increase the operating charges. If we are to subsidize, it might be well to know just what that subsidy is and not bury it in an aid transaction.

There are always two sides to any story, and this one of inflation and continued increased costs is no exception. While labor, today, is taking full advantage of its newly found power, it is certain that there are forces other than labor at work tending to keep prices up and the value of the dollar down. After some resistance to the increased costs and demands of labor, management has apparently found it to be easier and more convenient just to go along with such increased costs, tacking them onto the selling price together with a little increased overhead and profit for itself. Late experience has proven that labor will get most, if not all, of its demands and that the production of the so-called mediation period is lost. Management will probably be bargained into paying the wages for the non-productive period, thus suffering a double loss. This being an era of a seller's market, management is apt to be a little greedy to keep its production line moving in order to reap the advantages of that market. True, management has stated its case in the public print, but its case received little publicity and very



Photograph Courtesy Lake Carriers' Association

25,000 BUSHELS OF WHEAT PER HOUR

Largest grain receiving port is Buffalo, where huge elevators store the grain over the winter or while it awaits transshipment. Ships of the Great Lakes, highly specialized, are among the world's most efficient.

little consideration. Most people are not particularly interested in the trials and problems of management and are not apt to accept the logic of the economics involved. When they want bread, they want a loaf right then; the question of its production becomes academic. We are likely to question or neglect the fact that management requires that the selling price of its product carry something to replace tools, equipment, and plant facilities so necessary to production but which are daily wearing out and becoming obsolete, all of which will become more expensive to replace. As an example, the S.S. *District of Columbia*, the popular night boat from Washington to Norfolk, recently was involved in a collision which would have required certain repairs to make her seaworthy. During the investigation as to whether it would be worth while to the Company to repair the vessel for further service, it was stated that the vessel was built in 1925 at a cost of about \$800,000, at which time and figure she was the pride of the Potomac. That cost was somewhat above

the \$200,000 cost of the older vessels, but she was a fine modern vessel, well fitted for a specialized trade. After the collision, it appeared that the cost of repairs might be greater than the original cost of the vessel—and a replacement vessel at today's cost would be about \$3,500,000. Operating costs had advanced to such an extent that her profit to the owners for the year 1947 was less than \$6,100. Suffice to say, the night boat to Norfolk is a thing of the past.¹

The steel industry recently made a public statement that the cost of facilities had tripled within the past few months. One major oil company has recently stopped work on a large project which it had in hand due to the excessive costs which were developing, cancelling out the preparatory work at a considerable sacrifice. Costs today run into figures reminiscent of the old German Mark and the Russian Ruble. As a

¹ This article was written in early 1949. Some conditions have changed, but few for the better. The *District of Columbia* again plies the Potomac under a different house flag—and the costs of travel have increased.



Photograph Courtesy of General Electric Company

FIRST OF THE POST-WAR 12,500-SHP SUPERTANKERS

Despite the difficulties encountered by our Merchant Marine in foreign competition, ships such as the *Esso Zurich* are among the finest tankers on the high seas.

nation, we can not seem to think in other than fantastic figures, the new look in finance. Our Federal debt exceeds \$252,000,000,000 and the proposed budget for the coming year is in excess of \$41,000,000,000, the greatest ever. It is reported that a radio comedian will receive over a million dollars for the shifting of his program from one radio network to another, and that is no laughing matter. Why, \$30,000 is awarded for correctly guessing the name of a song! Federal, State, and local politicians are investigating further methods of taxation to implement their platforms of promises. Foreign States, having tasted of our aid, now predict all sorts of dire consequences if we do not continue to expand the flow of goods and dollars. Certain of our Congressmen are predicting national bankruptcy if we do not curtail our spending spree at home and abroad. It surely behooves each of us to give some thought as to where we are heading, what is our limit of capacity as to spending, and what is really best for us as individuals and as the greatest nation on the face of this troubled world.

We are a great Nation; we have become great and powerful due to our wealth of natural resources, our citizenry of a heterogeneous background welded into a homogeneous, tolerant commonwealth of people—and our youth as a Nation. We have grown up to that age where we must, and have, assumed world leadership. Our past wealth of natural resources now shows its limitation and our people have been given a preview of some of the supposed benefits of the socialistic state. Our history indicates that throughout our past there have always been those who cried "Wolf," fearing that the Nation was bound straight for a Bust. Even lately we have heard the phrase "Boom or Bust" as a battle cry. Thus far each crisis has been but a pause in our further progress. Our policies may not always have been wise, having sometimes been dictated by political expediency. Often our hearts, rather than our minds, have guided our acts. Nevertheless we have come through and grown greater and greater because of that something that is known as American. With diminishing

natural resources we shall have to nourish and cherish our American spirit and will to succeed. We must not forget the principles which have made us great.

What are some of the justifications or reasons for today's high labor costs? He would be brave, indeed, who would try to condense such a broad subject into anything less than volumes. There are trends and set arguments which are well known. Workmen in the building trades have always demanded higher than average wages, it being contended that the building trade was a seasonal occupation. At one time that argument was quite reasonable. Today there is little of a seasonal nature in the construction field, but the precedent has been established and carries over; men in the building trades must be paid a higher hourly wage than the production personnel who will follow them. There is a big backlog of needed construction and, under the closed shop conditions, it is well protected, thus insuring the continued welfare of this group. This huge backlog and the urgent need of certain types of construction lead to a certain amount of overtime work, which increases the weekly take-home dollars. Once the high weekly take-home wage has become established it is difficult to drop back to the average weekly scale. When it happens on any particular job, that job becomes unpopular and is made to pay in one way or another. Thus it is easy to see how high costs come about in this field. First, a high hourly rate is necessary because the work is seasonal; then more than a forty hour week must be worked in order to progress the job and make that particular job attractive, thus establishing an above average weekly take-home wage. The high weekly take-home wage having become established, it becomes quite sacred and must not be lowered—but the hours of work must get back to the forty hour week. The result is a higher hourly rate and the cycle starts once more. With a thirty hour workweek, at of course the same weekly wage as the present forty hour week, will it not be fun; there is so much more margin in which to play.

A somewhat similar situation developed in the nation's shipbuilding yards during the last war. Many new yards were built at building trades rates, thus more or less

establishing weekly wage scales in the various communities. Men were needed to build ships, and the construction gang, right on the ground, was the immediate and available pool. It was not considered reasonable to knock down a man's standard of living just because he was to build ships rather than the ways on which the ships were to be built, so the building trades rates crept into the shipbuilding industry. Other arguments were offered for the high rates paid in the shipyards, such as to compensate the man for leaving his comfortable old homestead and working in an out-of-the-way shipbuilding yard, a job which would only last for a limited period of time when he would again have to return to his hometown and the lower wage scale. Then there was the dilly wherein it was contended that the high wage scale was necessary so that the workmen could buy more Government bonds to help pay the cost of building ships. That is not a figment of the imagination; the argument was actually offered by a man who was supposed to have good sense.

The pattern of increase upon increase could be traced through the other trades—increases in money, in paid time off the job, retirements and lessened effort requirements, all of which run up the cost of production. As a result, wages have gone up and typical hourly rates now in effect by one concern not noted for being lavish are:

Crane operator	\$1.57
Machinist, general	1.75
Utilityman	1.35
Truck driver	1.30
Blacksmith	1.70
Laborer	1.16

with provisions for a certain amount of overtime, group insurance and hospitalization, paid holidays and vacations added.

So much for conditions as they are. They are well known, recognized, and the subject of debate in the Halls of Congress. Everybody is agreed that something must be done to stop spiraling costs and return prices to a more reasonable basis; they are not agreed as to the remedies necessary. Labor claims to have won the last election and thus to have gained the right to dictate what laws shall remain in effect and what methods shall be pursued. Since less than half of the po-

tential voters did vote and the resulting popular vote was close in the case of those who did exercise their option, it is not clear that the American people have really stated their case. Times are still considered "Good," and each and every one of us has hopes that things will not get completely out of hand, that our natural good sense will come to our rescue. Everyone appears to be reasonably happy while the merry-go-round continues to turn, but there will be a scramble when it stops.

With respect to our own personal problems, what should be our course? Shall we hope that we, too, will receive a boost in pay and hope that the increase will solve our problems for the time? That appears to be the modern trend—to seek a pay increase and continue paying the freight until the rates become so stiff that another raise is necessary. That may not be a wise policy. Would it be wise to start and continue blood transfusions without attempting to close the bleeding wounds? It is probable that with some of the lesions closed there would be less need of pumping in new blood. It is also reasonable to believe that were a policy adopted of holding costs

from climbing higher and higher, be it due to high labor costs, high profits, excessive advertising, wasteful management, excessive salaries to high executives or for any other reason, and of allowing the old law of supply and demand to function, of paying to each as he shall merit through his production instead of just circulating more and more money, that we might regain our economic well-being.

We are competing in a world wherein Democracy is on trial. Communism delights in havoc and, despite its protestations, is a foe to anything democratic in principle. We must continue to exercise our right of free thinking, our duty in electing those who shall serve us and our privilege in being Americans. We must remain strong in our faith, determination, and in our dollar value. Our dollars must be our servants at home and our respected emissaries abroad. We must set our own house in order, and that can not be accomplished by allowing the dollar cost of our goods and services to spiral ever upwards. We can not afford to put our dependence on more and more printed dollars not backed up by real value.



INTERFERENCE

Contributed by MR. JACK LEWIS

All through the war, both in the United States and on captured ground, the Marine Corps firmly advocated combat training and combat conditioning. Out of this came many lessons that were not only useful in actual warfare, but supplied the men involved with numerous laughs.

During the war, landing maneuvers were being held on the California coast with components of the Fleet and a large body of Marines taking part.

A landing problem was involved in which troops were embarked from troop transports into landing boats, and with naval gunfire, air support, and all of the other real-war trimmings, the landing was made.

Just as the first wave hit the beach, a young and rather green lieutenant discovered that his walkie-talkie was on the wrong wave length. To his horror, the only thing he could pick up was rhumba music from the commercial radio stations in the nearby town of Tia Juana, Mexico.

In desperation, he started shouting into the mouthpiece in his attempt to contact the company commander. Still, all he could pick up was the Latin-American dance music. Then the music stopped and the voice of the company's ancient and salty first sergeant broke through with a touch of the caustic.

"Take it easy, lieutenant," the voice cautioned wryly. "The skipper'll let you know the scoop between bars and notes!"

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS.)



Official U. S. Navy Photograph

VERY DIFFERENT FROM ANY MERCHANT VESSEL

The U.S.S. *Midway*, which made the 14 day training cruise described in the accompanying article.

A MERCHANT MARINER LOOKS AT THE NAVY

By COMMANDER C. W. SANDBERG, *U. S. Maritime Service*

PART I

THE following paragraphs are a collection of unrelated observations of a Merchant Marine officer on a Naval Reserve cruise.

My orders arrived shortly after I had put in my request for two weeks training duty. The special jargon of the Naval establishment was refreshingly clear. I was to board the U.S.S. *Midway* (CVB-41) at Norfolk, Virginia, for a 14 day training cruise to Panama and return to Norfolk. A quick search through some shipping books and I had the essential data concerning the *Midway*. It was most impressive.

I looked forward to boarding the *Midway* with much anticipation. In view of the fact that I was unacquainted with the actual, detailed, daily routine and methods by which the Navy sailed ships, I carried with me to Norfolk a considerable amount of suspicion. My own sea-going experience consisted of running a watch, aided by a fireman and an oiler, for some years on a Socony tanker. This background caused me to regard the prospect of standing a watch, assisted (I was confidentially informed) by at least 50 additional men with the tolerant and definitely superior air worn by all Merchant Marine officers when Navy shipboard complements are mentioned.

I also carried with me a background of hours and hours of "shooting the breeze" with Merchant Mariners on the subject of the Navy and Navy officers. I had reason to believe, too, that I had some understanding of the Navy officer's opinion of the Merchant Marine and the men who sail her ships. Or, at least if I did not know the Navy officer's opinion I knew what the average Merchant

Mariner *thought* was the Navy officer's opinion. These opinions are deep-rooted, uncomplimentary and, I honestly believe, slowly disappearing. Stated as simply as so complex a situation permits, the Merchant Marine officer considers the Navy officer to be a sea-going dandy who never gets his hands dirty. This is especially true of the Merchant Marine engineer who is likely to add to this definition of the Navy officer the statement "he's not even a *good* engineer." A Merchant Marine engineer could make no more reproachful remark.

The Navy officer is thought to consider the Merchant Marine officer as a rather uncouth and grubby fellow who made bucketfuls of money during the war and who has nothing else but dirty fingernails. The Navy officer, however, does recognize the Merchant Marine officer as a good engineer. This, alone, indicates to me that the Navy officer is somewhat less prejudiced than his cousin mariner, and I suspect such is the situation.

These two sets of unflattering opinions nursed from generation to generation by two separate groups of pouting mariners has always interested me. It is perhaps fortunate for the nation that these opinions never have

COMMANDER SANDBERG graduated from the New York State Merchant Marine Academy in 1934, and sailed as an engineer in oil tankers until 1939. Then for one year he surveyed European Merchant Marine Officer Training Programs for the U. S. Maritime Commission, after which he was trial engineer in the shipbuilding division of the Bethlehem Steel Company. In 1942 he went on active duty in the Navy and was assigned to the U. S. Merchant Marine Academy at Kings Point, N. Y., as Assistant Head of the Department of Engineering.

The opinions or assertions in this article are the private ones of the author and are not to be construed as official or reflecting the views of the Maritime Service.

done more than stir slightly from their normal dormant condition once or twice during the heat of battle.

And that is one of the strange things about these two opinions. They are not active, debated in press and radio. There has never been, to my knowledge, an attack and counterattack of serious proportions between the Navy officers and the Merchant Marine officers. And there should not be, even though these two critical opinions exist, albeit in diminishing proportions. I suspect the reason they have never been vociferously debated is that each group of mariners has been too busy with its respective job of sailing ships.

These opinions exist, rather, in the form of a muttering, for example, between Merchant Marine officers leaning on an after rail pronouncing judgement on a passing naval vessel which has just completed a smart return dipping of the ensign. Or, it can be detected in the snort of a Navy officer at the bar of an Officers Club when someone asks him about his convoy experiences. The most recent, and pointed, comments appeared in late issues of the UNITED STATES NAVAL INSTITUTE PROCEEDINGS as the result of a Coast Guard officer's article on a "Well Disciplined Merchant Marine."

Thus, and sketchily drawn, was the background material I carried aboard the *Midway* with me. And, opportunity of opportunities, I was going to get a good close look at these nautical dandies who never got their hands dirty. In return they—if such was their pleasure—could watch the antics of an uncouth, grubby, Merchant Mariner with dirty fingernails.

Those Merchant Marine officers who went on active sea duty with the Navy during the war were no doubt as interested, surprised, and impressed in an odd way as I was, to discover another way to run and sail a ship.

The more I think of it, the more I conclude that no valid comparisons between the Navy and the Merchant Marine can be made with respect to running ships. We both sail the Seven Seas, but we sure do it differently!

The difference is caused obviously by the different functions of each. Merchantmen carry passengers and cargoes on commercial

ventures for a profit; naval vessels carry armament to destroy the enemy at the taxpayer's expense. Difficulty arises when naval vessels start to carry cargoes. In fact, most naval cargo vessels are either actually or essentially merchant type vessels. But the basic difference still exists; the Navy ship is a ship of war, or at least a ship manned for war; the merchant vessel remains at any time an inadequately armed vessel of peace and commerce.

These separate and distinctive functions cause the shipboard difference instantly noted by a Merchant Marine officer who finds himself aboard a Navy ship.

Even though I repeated these things to myself, I proceeded to my room on the port side, forward, immediately under the *Midway's* flight deck, suspicious of a system which required fabulous numbers of men just to run an engine room. I had been told that the black gang consisted of 900 men!

I was determined, however, to make what comparisons I could. I thought that such things as personnel supervision and relations, minor details of shipboard life and etiquette, type of professional work and knowledge required, methods of standing watches, etc., could well serve as a basis for comparison.

My first inkling that I was to find myself face to face with a really fantastic sea-going situation was when we fell in for General Quarters immediately after shoving off. I started down a ladder leading to the hangar deck and then suddenly stopped in amazement. There before my eyes was a veritable sea of men!

In appearance the hangar deck rather resembled a pier which had been partially converted into a gymnasium and which was simply crammed with men in sailor's uniforms. I guess there were easily 3000 men, including the Reservists. As I made my way to that section of the hangar deck occupied by the Engineering Department I was reminded of a certain shipyard experience I had had. Just before the war I served six months as a trial engineer at the Staten Island Yard of the Bethlehem Steel Company. At the end of a shift I would find myself in the midst of a flood of men which would disgorge itself from the numerous ships under construction and move in a solid mass

towards the exits. I had a similar feeling now as I made my way along the *Midway's* shining hangar deck.

In spite of the thousands of sailor's uniforms surrounding me, I had difficulty believing I was aboard a ship. I had never in my whole life seen so many people assembled in one place at one time aboard ship. I almost convinced myself that this was some Navy trick expressly designed to confuse a suspicious Merchant Marine officer.

I could not imagine what all those people were for but, having had some administrative experience, I was acutely aware of the monumental job of supervision necessary for so large a group of people—and sailors in the bargain!

It was quite obvious that the Navy officer and the Merchant Marine officer have functions with respect to personnel which differ in many respects. As I observed it, the Naval officer (and I refer to Division Officers, since they most closely resemble their Merchant Marine cousins) has a much larger group of men under his direct supervision. As a conservative guess I would say the Navy officer supervises from five to ten times the number of men a Merchant Marine officer finds under his jurisdiction. I also noted with considerable interest throughout the cruise that all orders passed along from the Division Officer to the personnel under him were carried out, as the saying goes, with alacrity. In the Merchant Marine this happy situation does not always, as another saying goes, obtain.

It seems to me that the personnel problems of the Division Officer aboard a naval vessel concern themselves mainly with keeping track of the men and figuring out what to do to keep them occupied. In this latter category I am thinking of the educational and welfare programs.

The Merchant Marine officer on the other hand has quite a different problem. The average Merchant Marine officer has two men under him, and he has no trouble keeping track of them. His main efforts are concerned with not figuring out what to do to keep them occupied but simply how to get them to work in order to keep the ship from running down.

I am convinced that a Navy officer sud-

denly transferred to a merchant vessel as a Watch Officer would, after issuing orders, find it expedient to carry in his hip pocket the slim blue-covered edition of *Naval Leadership*. I am also certain that after several trips the book would automatically open to the paragraphs on "Self-Control!"

I wonder what the reaction of a Navy officer would be if he learned that the men in his division had conducted a meeting while underway, and had voted him off the ship for one reason or another?

The true American seaman is a rugged individual who has had many pressures put upon him. For too long a time the shipowners were indifferent to his welfare; for too long a time his life was an extremely hard one, completely devoid of any feeling of security; for too long a time was he kept at sea without a break and without normal activities designed to make his life more attractive. The result was the standard, mad fling of the "drunken sailor!" The unions appeared and gave him a sense of importance and power which he never had before. And then these unions were found to be heavily infiltrated with Communists, against whom the mariner has waged an increasingly successful battle. The seaman found himself—sometimes by choice, and sometimes not—completely regulated by union agreements which defined down to a gnat's hair what he should and should not do during his working day.

How different, indeed, the background of naval personnel with their retirement programs, shipboard movies, and athletic programs, P. O. and enlisted men's clubs, educational programs, Ships' Service stores, and a host of other real advantages.

And let no Naval person think that after 20 or 30 years' work the Merchant Marine officer or crew member ends up the wealthier man. It is true that there are periods such as during a war when a Merchant Mariner earns interesting money before taxes, but it is equally true that there are periods when he earns absolutely nothing. Unusual indeed is the Merchant Mariner who gets paid every day for 20 or 30 years. The average earned income is far from spectacular!

I agree wholeheartedly with Captain Matthew Radom, U.S.N.R., who wrote in

the June 1949 issue of the PROCEEDINGS in the Discussions column: "I have watched the development of industrial relations in the Merchant Marine for the past dozen years. One must look at the present picture against the background of the past. There has been tremendous improvement. There is room for much more. But there can only be progress if all hands who are concerned with the problem give it as much thought and planning as is given all other phases of the business. The labor unions have become increasingly aware of their responsibilities and have attempted (against great odds) to weed out the drunks and 'one-trippers.' Many owners and operators have worked out schedules and reliefs which allow seamen more time off ashore to live a more nearly normal life."

Thus, briefly, is part of the background of the Merchant Mariner. Cutting through all these factors which have kept and do keep the morale and happiness of the mariner a most fluctuating thing is the always present necessity of getting men to work in order to keep a vessel shipshape. To the Merchant Marine officer who could accomplish this there can be no word of reproach. And were I a Navy or Coast Guard officer I would be particularly cautious about discussing leadership with such a Merchant Marine officer. I rather think he has a great deal of information on this subject which can not be obtained from any book.

Nothing that transpired on the *Midway* during the remainder of the voyage caused me to change my mind of the opinion that the Navy officer and the Merchant Marine officer share no common personnel problems. The closest Merchant Marine parallel in the matter of personnel that one can strike, for example, to a Division Officer in the Engineering Department of a Navy ship would be the Chief Engineer, or Staff Chief Engineer, of a passenger vessel. And, I am afraid, this parallel is something less than parallel at many points. But of one thing I was convinced: no valid comparison of the Naval officer and Merchant Marine officer could be attempted if the supervision of personnel was to be used as a basis for comparison.

The next phase of my education aboard the *Midway* concerned the Officers' Mess and where I sat to eat. Knowing the rather rigid

protocol generally followed in the Merchant Marine in the matter of who-sits-where for meals, I got one of the surprises of my life. We Reservists were simply shuffled into the Ship's Company and we sat down in the order of dates of rank. I had napkin ring number 25 and in view of the fact that there were some 40 places in the No. 1 wardroom, that was where I found myself. I soon learned that a wholesale backing up in the matter of seniority by the Ship's Company had been caused by the influx of Reservists, with the result that many permanent members of the ship's crew had to change messrooms. This, I agree, is a detail of no great importance, yet I think it does show, at least, a phase of shipboard life and etiquette concerning which there is, again, no basis of comparison between the Merchant Marine and the Naval officer. This giving-way to the Reservists by the officers of the *Midway* reminded me of the Merchant Marine Chief Engineer who came into the messroom and found someone else sitting in his chair at his place. He turned on his heel without a word and immediately returned to his quarters. It was necessary to serve his meals in his cabin for about a year, I think, after which time he left the ship—otherwise it would probably still be going on.

There are those who will say that this, indeed, is small pickings and represents a truly exceptional case. Perhaps my point is too strongly made. I do think, however, that a Merchant Marine officer asked to relinquish his mess place to a visitor would consider the request to be a sharp and unwarranted intrusion into his shipboard life and position.

Insofar as I am concerned each action is correct because here in the mess room was clearly exposed another obvious difference between the Navy officer and the Merchant Marine officer. The Navy officer rigidly follows a date of rank procedure and is transferred about from one ship to another with scarcely the bat of an eyelash. The Engineer Officer of the *Midway*, for example, had just been transferred from years of duty in submarines. This reassigning of officers from submarines to carriers to destroyers to cruisers to shore duty at intervals seems strange to a Merchant Mariner. One senses that the Navy officer feels himself part of a

huge fleet and his roots do not tend to sink into any one ship.

The Merchant Marine officer, on the other hand, always is part of a much smaller fleet, and he tends to become attached to one ship which becomes his "home." His ship is a personal thing to him, and his seat in the messroom a measure of his achievement on that particular vessel.

I feel I can safely say, therefore, that even in the matter of their attitude with respect to their ships, Navy and Merchant Marine officers have little common ground for comparison. To the Navy Officer, the ship he happens to be on at the moment appears to be another assignment. To the Merchant Marine officer, the ship he happens to be on at the moment might well be the ship on which he will spend a major part of his seagoing life.

I was, therefore, half-expecting a few justifiably cold and resentful looks from the Ship's officers as I took my place in Wardroom No. 1 of the *Midway*. I detected none. As a matter of fact, everyone seemed happy over the whole thing. At first I thought that perhaps my particular messroom was inhabited only by Reservists, therefore small wonder that everyone was happy. This was not true. I soon found it a simple matter to distinguish between Reservist and Ship's Company. For others who may be interested, the way to distinguish between the two is to look at their plates.

During the first week on a training cruise, a Reservist (Merchant Marine, Organized or Volunteer) eats approximately three times the quantity normally consumed by a member of the Ship's Company. I mean this as no reflection on home-cooking or manners but simply the reporting of a situation caused, I believe, by a moving deck, salt air, and an absence of concern over the grocery bill.

The whole atmosphere in that No. 1 wardroom was one of pure delight for me. There was absolutely none of the "class-ring" business I expected to find. There was a total absence of that "superior Annapolis attitude" which most Merchant Mariners consider to be standard equipment with Naval officers. Conversation ran rampant, and technical things ranging from submarines to V-2's were thoroughly discussed.

The *Midway* is, of course, one of our mightiest ships. Perhaps the relative newness of this type of vessel helped establish the completely friendly feeling aboard; perhaps the mixture of "trade-school" boys, "mustangs," ex-Reservists, and Reservists in the ship's company had something to do with it. I don't know. I had heard of Navy ships on which the officers would sit around the mess table with their hands folded before them in such a position that the most prominent thing about them was their class ring. Maybe this sort of thing does exist on some ships, but I can report to my shipmates in the Merchant Marine that I know of one Navy ship where a close inspection lasting two weeks (during which time we must have caused the men aboard considerable annoyance) failed to reveal any feeling of "Annapolis superiority."

It was most perplexing. The place where I expected to find in full bloom the Navy snobbery rated so low by Merchant Mariners was absolutely devoid of it. But of course! I had the answer now! These people in the messroom did not realize that I was a Merchant Marine officer!

So I casually announced that I was a Merchant Marine officer, and then became super-alert in order not to miss even the slightest change of attitude. Again I must report to my shipmates in the Merchant Marine that what I detected was quite the opposite of the curled lip and the bared fang. The only change in attitude that I was able to detect was a possible renewed interest in me as an individual, and certainly a more active professional interest in me as a ship's officer.

I had expected that this closer scrutiny of me would be unpleasant because it had been my opinion that such an inspection would be done in a most critical way. I have never reacted favorably to such experiences, and I did not think I could change my nature at this point. Possibly I was anticipating the type of once-over which I had been giving the *Midway* since I got aboard.

Fully prepared, therefore, to undergo what I expected to end up as an unpleasant experience for me, I again found myself in possession of that stranded feeling experienced by all men whose most cherished

beliefs are proved inaccurate. I was made to feel in short order that insofar as the business of having the responsibility of operating and maintaining a ship's propulsion plant was concerned, I was considered to be in the expert class! This was a new sensation for me, because in my own circle of Merchant Marine friends the opinion that circulates concerning me has, I am very sure, a long way to go before it reaches such a satisfying level.

It was all very confusing. I was not being treated as though I was an uncouth and grubby fellow with dirty fingernails. Here is one example! We were assembled for a lecture by the Engineer Officer in one of the Ready Rooms where the aviators are briefed. He was going to give us details concerning the operation of the main propulsion plant and some of the special problems that arise concerning this machinery. There were a few of us Merchant Marine Naval Reservists in the group. The Engineer Officer began his lecture by what could almost be classed as an apology to the Merchant Marine officers present. He said, as closely as I can remember, "I guess this might prove pretty boring to you Merchant Marine officers, as you can no doubt handle this machinery better than we can."

After I sorted my dazed thoughts I tried to think up a parallel for this remark. The nearest I can come is that for a Merchant Marine officer to hear an Annapolis officer make such a statement is like having Macy's announce that Gimbel's gives better value.

I again thought that I was being the victim of a vast Navy plot designed to so confuse me that I would leap off the stern of this fantastic vessel and disappear into the huge wake, thus reducing by one the number of suspicious Merchant Marine officers at large. But this time I was ashamed of having entertained such a thought. Here was a group of honest, serious minded, sincere men devoted to the tremendous task of trying to keep this huge ship in first class condition. I will guarantee that any group of Merchant Mariners who found themselves manning this ship would quickly conclude that the business of just keeping her afloat, moving, and shipshape would prove to be a monumental task. Add to this, the fact that she should be ready to fight at the drop of a hat,

launch and receive aircraft, and one has such a staggering project that I am quite sure most Merchant Marine officers would decide without loss of time that the commercial side of sea-going has certain advantages. Certainly it is less wearing on the nerves.

The more I observed the functions of the various Navy officers during the passage to Panama, the more I realized how completely different were the respective duties and responsibilities of the Navy officer and the Merchant Marine officer. Actually, the only common ground they have is that each finds himself aboard a ship, and each knows the feel of a rolling deck beneath his feet. There is as much justification of stopping the first two men one meets walking down the street and comparing them point by point as there is in striking comparisons between the Naval and the Merchant Marine officer. Just because two men walk down the same street does not automatically mean that they should be identical in every respect. And just because two men sail the Seven Seas does not mean that they should be identical in every respect.

I had only, at this point, observed personnel supervision and relations and minor details of shipboard life and etiquette. From what I saw I was convinced that these two factors could not be used as a basis of comparison except to prove that the Navy and Merchant Marine officer, of necessity, have different functions with respect to these two items.

I thought of the time and energy expended by a large number of officers developing the two theses: (1) that the Navy officer is *really* not a mariner; and (2) that the Merchant Marine officer is a rather repulsive form of maritime life that should be kept locked in a closet and brought out every once in awhile to frighten children and impressionable young virgins into good behavior. I concluded that if these officers spent the same time and energy trying to understand the special and particular responsibilities and problems of their fellow mariners, a very healthy step would have been taken in the direction of mutual respect between the Navy Officer and the Merchant Marine officer.

PART II

Some time later I climbed up as high as I could on that strange island-like structure so characteristic of aircraft carriers. This put me quite a way above the *Midway's* flight-deck but still a good number of feet beneath the ever rotating radar antennas.

I was able to get an over-all view of this strange vessel. The flat flight-deck just seemed to be shoved along over the surface of the water. I could see no trace of a ship's hull. I could see no recognizable stack or masts. I could see no bow wave. By looking at what appeared to be a mile aft I *could* see signs of a wake.

The sight of the wake pleased me because it re-established the fact that I was aboard a ship. I had wondered what manner of thing this was on which I found myself. Here I was peering down about one hundred feet at an odd-shaped flying field which was apparently sliding over the Gulf Stream. My sailor's appetite for sea-going surroundings was only partially satisfied by the snack offered by the sight of the wake. The only topside gear visible from my position above the Navigation Bridge that could also be found on a Merchantman consisted of signal halyards and radar antenna. Even with these two items there is a vast difference between the Navy and the Merchant Marine. On a Merchantman one might find a radar antenna and a couple of signal halyards. Navy ships, and this one in particular, have radar antennas perched all over the upper superstructure, and, during a battle problem, it seems impossible that so many signal flags could be continuously raised, flown, and lowered at the same time.

If any ship was ever designed to prove to me, at least, that no valid comparison between Navy and Merchant Marine officers could be made, that ship was the *Midway*.

As I gazed down at the line of aircraft commencing to respond to Flight Quarters I was again struck with the unreasonableness of the opinions Merchant Marine and Navy officers entertain with respect to each other. The uncouth sea-going money grabber versus the nautical dandy who isn't *really* a mariner! What rot!

As I watched these "nautical dandies" launch aircraft and commence anti-subma-

rine exercises I wondered why the Merchant Mariner could not understand that these men are primarily warriors and that all their practices are geared to wartime conditions.

I wondered if that happy day would arrive when Merchant Marine officers would stop pointing the finger of scorn at the size of Navy crews. In this atmosphere of dive bombers stitching small white geysers with their machine guns on the flat, blue surface of the sea, I was unable to think of the name of any wartime Merchant Marine officer who objected to having his ship's complement increased by the addition of a gun crew.

At this point my reflections were interrupted by one of the aircraft which, during landing operations, just missed crashing into the barriers below and slightly aft of my position above the Navigation Bridge.

I watched the strangely uniformed Landing Signal officer with his brightly colored paddles wave aircraft after aircraft to a safe landing aboard. The tenseness of these operations left me rather weak.

The Navy had, I quite pompously thought, made extraordinary use of the basic nautical sciences brought to it from the Merchant Marine by such men as John Paul Jones, Stephen Decatur, Edward Preble, Thomas Truxtun and others.

I descended to the Navigation Bridge below for a brief look. When I spoke to the Navigator I learned to my pleasure that a Merchant Marine Reserve officer was a regular member of the ship's company assigned to the Navigation Department. My pleasure was naturally increased when I was told that this Merchant Marine officer was definitely a superior watch officer.

I did notice one action on the Navigation Bridge which differed from the Merchant Marine. I noticed an officer using a sextant, and at the cry of "Mark!" an enlisted man began measuring time. The officer and the enlisted man then proceeded into the chart room where, I presume, the enlisted man would establish the absolute time the sight was made. I compared this with watching the same procedure on the bridge of a Merchant Marine oil tanker.

I remember watching my friend, the Second Mate, look through his sextant and then suddenly start counting "one and a two and a three and a four and a . . ." until he checked against the chronometer in the chart room.

My interpretation of this is that with practices common to the Merchant Marine and the Navy, less individual effort is required by the Naval officer. The other side of the medal is that with this possible advantage the Naval officer inherits additional administrative duties caused by the very people who relieve him of a certain amount of work.

I was to find that this also held true down in the engine room for which I headed after taking leave of the Navigator.

The *Midway* has, of course, a large number of compartments and spaces which make up the engine room. My destination was the Main Propulsion Control Room. This was the center of engineering activity; it was here I hoped to examine at close hand two factors which I considered to be most important in the comparison of Merchant Marine and Navy officers: these were the type of professional work and knowledge required, and the method of standing watch.

I presented myself to the Watch officer in the *Midway's* Main Propulsion Control Room. This was my station during the first week of the cruise, during which time I was to consider myself in training for qualification as Main Propulsion Assistant.

This room was one of the main engine rooms and contained, naturally, a complete main propulsion turbine and its immediate auxiliaries. From this location the Watch Officer administers the operation of the remaining main propulsion rooms, the boiler rooms, evaporator rooms, feed pump rooms, generator rooms, steering engine rooms, and half a dozen other places I've probably forgotten.

I soon discovered that it was as simple to become familiar with the machinery in any one of the engineering spaces as it was difficult to find these compartments. The sub-dividing of the engine room spaces into water-tight compartments had been carried to a fine point indeed. For example, a boiler room contained but one boiler and its fuel

oil burning gear. This, of course, is standard Navy procedure and is obviously a delightful arrangement to have when a ship has been torpedoed.

From the point of view of a Watch Officer, however, this compartmentation certainly imposes a limitation on activities while on watch. In the Merchant Marine, it is the custom for the engineer to visit all the machinery spaces under his jurisdiction as a Watch Officer and to examine and "feel over" all the operating machinery in these spaces.

I tried it once on the *Midway*, and after three hours of climbing up and down ladders I was so exhausted as to render myself unfit for any further usefulness to the watch. I am well aware of the fact that the *Midway* is one of the world's largest and most powerful vessels afloat; however, the theory of compartmentation as employed by the Navy is obviously one of the causes for the relatively large size of Navy crews. It is also one of the factors which make the functions of the Merchant Marine and Navy Watch Officer so different.

On the standard Merchantman the Watch Engineer is able to penetrate into any of the engineering spaces by moving in a horizontal direction or, at most, by running up a short ladder. And he can do this in a matter of seconds. Thus, the Merchant Marine officer is able to keep, and, as a matter of fact, is required to keep all activity in all machinery spaces under his personal supervision. He is never more than a quick dash and a flying leap from the throttle.

On the standard Navy ship the Watch Officer can penetrate into the various engineering spaces only by moving in a vertical direction. This business of climbing up out of a main propulsion room to some deck above the water line and then down into a boiler room to end up perhaps twenty feet away from the starting point has the effect of relieving the Watch Officer of that acute sense of responsibility felt by all Merchant Marine Watch Officers. The Navy Watch Officer is obliged to rely upon telephone communication and therefore cannot be regarded as personally responsible for happenings in what amounts to an inaccessible machinery space.

*Official U. S. Navy Photograph***MIDSHIPMEN LEARN TO LIGHT OFF A BOILER**

Warships and merchantmen are so different in their demands on engineers that there is very little ground in common for comparison.

From this single comparison it is my conclusion that the Navy Watch Officer does not feel the same burden of responsibility as his Merchant Marine cousin. This feeling is further enhanced by such members of the Navy officer's watch as a throttleman who relieves the officer of the necessity of maneuvering the main engine. This would be considered a flagrant luxury in the Merchant Marine where the Watch Officer not only maneuvers the main engines but will probably answer the telegraph, signal the fire-room, and record the bells unless a Merchant Marine Cadet-Midshipman happens to be aboard.

As I saw it, the Navy engineer officers from the Senior down through the Junior Division officers are executive, supervisory, or administrative engineers. In the Merchant Marine, with the exception of the Chief

Engineer, the Assistant Engineers are part supervising and completely operating engineers.

I strongly suspect that the Merchant Marine engineer officer who served in the Navy was surprised to discover how long his fingernails stayed clean.

From my point of view—and I believe most Merchant Marine engineers would agree—the business of standing engine room watches without ever monkeying around with some machinery must be too boring for words. I know that just the few watches I stood as an observer on the *Midway* reconfirmed my suspicion that one of the longest periods of time in the world is a four-hour engine room watch with nothing to do on a turbine-driven ship.

At least, in the Merchant Marine, when an engineer officer does nothing on watch, it

is by choice. If he wants to work there are always half a dozen jobs crying for attention, each fully guaranteed to occupy his thoughts and energies. His Navy Watch cousin, however, is almost chained to the Main Control Board; he can only wait with infinite patience until the four hours have dragged by.

From these observations on the *Midway* and from numerous discussions with Merchant Marine officers who served on active duty with the Navy during the war, I was satisfied that no valid comparison between Navy and Merchant Marine officers could be made if methods of standing watches were used as a basis for comparison.

I was now face to face with the last measure for comparison, and this was certainly a touchy one. It concerned itself with the type of professional work and knowledge required. I had heard over and over from my Merchant Marine colleagues that Navy officers weren't good engineers. I knew this was a subject which would require quite a bit of diplomacy because I feared that some place along the line someone's feelings might be injured.

As I thought about this phase of comparison I realized that my fears were unfounded. It was obvious that the definition of an engineer to a Merchant Mariner had no exact counterpart in the Navy.

The Merchant Marine engineer officer is primarily an operating engineer. He operates the machinery from maneuvering the main propulsion unit to starting the steering engine, cutting in the boilers, paralleling the generators, transferring the fuel oil, starting and stopping the refrigeration plant, operating the soot blowers, centrifuging the lube oil, and doing any other operating job necessary to the running of the plant. *He* does these things. In addition he has to maintain and repair the machinery. He may have to remove a ground from the board; overhaul an auxiliary diesel engine; pull the Freon compressor adrift, repair and assemble it; roll in a leaking economizer tube, plus a leaking condenser tube; turn down a valve stem or pump rod on a lathe; patch up the furnace brickwork; replace a turbine bearing; cut a keyway in a shaft on the shaper; or undercut the mica on a commutator. These

are some of the things a good Merchant Marine engineer officer should be able to do. This versatility is a necessary qualification for the job because, except for the larger ships, there is no one else to do these things.

The Navy engineer officer is not required to do these things. He has his Chiefs and Warrant officers who can do them. He is liable to be an officer pretty well versed in the theoretical aspects of engineering. After consultation with his Chiefs and Warrants, who are usually experts in one phase of marine engineering, he is quite capable of prescribing the repairs necessary to maintain his machinery shipshape.

There is no doubt in my mind that a Navy officer of average intelligence could become as versatile an engineer as the Merchant Marine officer if he were required to do so.

And I am sure a Merchant Marine engineer officer could become as versatile in ordnance and gunnery, military tactics, navigation, damage control and paper work as the Navy officer if he were required to do so.

As had happened previously with each phase of shipboard life and activity I investigated, I found no common ground for comparison. Even with such a thing as type of professional work and knowledge required, the Navy and the Merchant Marine were worlds apart! For the Navy officer to understand fully the feelings of the Merchant Marine officer, he should be acquainted with one fact which causes the Merchant Mariner much irritation. The badge of a Merchant Marine officer is his Federal license issued by the Coast Guard. This license was frequently issued to officers on active duty with the Navy much too easily by Merchant Marine standards. Frequently, several grades of this license were skipped, and the Navy Officer found himself in relatively easy possession of the highest grade of Merchant Marine license after several months of studying and cramming for a license examination which does not always accurately measure a man's attainments. Conversely, many an outstanding Merchant Marine officer found himself denied a Naval officer's commission because a finger or some back teeth were missing or he had an "open bite." This is an especially irritating situation.

I know that there are a number of exceptionally qualified Merchant Marine officers who are just aching to take an active part in the nation's Naval Reserve activities but are denied this honest and serious desire to serve our country because of what, to them, appear to be absurd restrictions. The Navy has recently started to seek Merchant Marine officers for a year's active duty. This is all to the good. I hope the Navy will go one step further and make available to those professional Merchant Marine officers who, for one reason or another, do not measure up to the Navy physical requirements, the Navy commission they so earnestly desire.

The cruise on the *Midway* convinced me that the Merchant Marine could learn much from the Navy and that the Navy could learn much from the Merchant Marine. It convinced me that there was no real basis for critical comparisons between the Navy officer and the Merchant Marine officer; only much misunderstanding.

As I prepared to leave the Main Propul-

sion Control Room of the *Midway* I wondered if I could make those Naval officers who held Merchant Marine officers in low esteem change their minds. I wondered if I could make the Merchant Marine officer understand that he had no right in making a pin-point comparison between the Navy officer and himself. I watched an instrument on the Main Gauge Board in this Navy engine room. It was moving very slowly, indicating to the Navy Engineer Watch Officer the speed and direction of the wind across the flight deck. I shook my head from side to side. With the roar of the turbines in my ears I went up to my quarters and turned in.

To those Merchant Marine shipmates of mine who will immediately conclude that I have been blinded by a single carrier cruise, I can only report that I have given this subject considerable thought, I have tried to be objective, and the *Midway* cruise represents but a part of my contact with the Navy.



MUTINY STOPPED—BY HUMOR!

Contributed by MAJOR BERTIL LARSSON, *Swedish Coast Artillery*

Mutiny stopped—by humor! The crew of HMS N.N. was not very happy. Their service had proved to be longer than expected. The food was not rather good etc. Some radical elements of the crew planned a mutiny. Not a bloody mutiny of course. But something *must be done*. H-hour was fixed to 6 o'clock one Saturday evening. Somehow the captain became aware of the plan just the day before. Next morning he ordered stations and addressed the following simple words to his crew: "I have heard you will have a little mutiny this evening. Now I am sorry to say, I have never seen a mutiny. Tonight I must go ashore. But tell me, wouldn't you start your mutiny at once or at least before 3 o'clock."

If the captain said any more, is not known. The laughter of the crew would have drowned any further words.

NO ADMIRAL-ITIS

Contributed by LIEUTENANT COMMANDER JOHN H. ALLEN,
U. S. Naval Reserve (Inactive)

The first public duty of a Rear Admiral who had just made his broad stripe was to officiate at the commissioning of one of the Navy's largest capital ships. The ceremony went off without a hitch, and as he and his wife were about to leave the ship, the sideboys began to pipe him over the side. Suddenly his wife grabbed his coat-tails, jerked frantically, and whispered with audible agitation, "Al, Al, not yet! Hold still! They're piping somebody *important* over the side! *WAIT!*"

With a mighty lunge the Admiral freed himself from the grasp of his worried spouse, and proceeded once more in dignified fashion, but not before the delighted crowd had heard his indignant answer, "Emmy! let go my coat-tails! That's *me!*"

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS.)



Official U. S. Navy Photograph

YOU WON'T ALWAYS BE ON ACTIVE DUTY!

And the wise naval officer plans ahead for the days of smaller pay and no quarters or allowances.

A SAVINGS PROGRAM FOR THE NAVAL OFFICER

By ASSOCIATE PROFESSOR ROGER FREDLAND, *U. S. Naval Academy*

PROFESSIONAL men in general are notorious for exercising bad business judgment in their personal investments. As compared to business men in the same income brackets, their estates at retirement are commonly woefully small. The reason for this is apparent: their day-by-day experience does not equip them to make wise investment decisions. Very generally they do not take the trouble to make the most perfunctory investigations before committing quite large sums of money.

What is true of doctors, lawyers, dentists, etc., in this respect is doubly true of Army and Navy officers. Not only are the professional concerns of the officer remote from the world of profit and loss; in addition the conditions of his personal life militate against his developing the local contacts which could be valuable to him in choosing an investment plan. Moving about on orders as he does, he is seldom able to stumble on a real estate bargain in a depressed market. Nor does he ordinarily have friends in banking or brokerage circles who can let him in on "a good thing in steel."

The Army or Navy officer is on all the sucker lists ever compiled. He pays premium prices for rents and uniforms and nearly everything else he buys. Perhaps the wonderful thing is that the officer ever saves anything at all, except the hope of his pension.

Admittedly no one is ever going to get rich on a Service salary. But it ought to be possible for every officer to amass enough to give him a tidy supplement to his retirement pay. It is only possible, however, for the man who will give a little thought to the matter at regular intervals. An estate does not happen. It has to be planned.

Perhaps the one indispensable item in any man's investment program is his life insurance. Certainly it is indispensable for a married officer. And, in fact, nearly all officers do carry life insurance. It is un-

fortunately not true, however, that most officers have a carefully planned insurance program tailored to their individual needs. Some carry too little insurance. A few carry too much. Nearly all carry too expensive types. Some insure the wrong people.

Now it is obviously not possible to say, "This and only this is a proper insurance program." What is proper and reasonable depends on age, marital status, number of children, supplemental income, and temperament. On the other hand, there are cases like that of my friend Lieutenant Commander X, who has straight life and endowment policies for fifty-odd thousands of dollars, on which the annual premiums total well over \$1,500. He and his wife have no children. They attempt no other form of saving, and frequently have to borrow money to meet premium-due dates. They have a small supplemental income from a trust fund, but are, and act, miserably poor. It is fairly evident that he is "over-insured."

What, in general, can safely be said about life insurance for an officer? Most obvious, probably, is the oft-repeated and ever true advice: Take and keep up the maximum amount of National Service Life Insurance that the government will sell you. No commercial company could come close to matching its value and still stay in business. Second, consider your individual needs, dis-

HEAD OF THE Economics Detail in the Department of English, History, and Government at the Naval Academy, Associate Professor Fredland served as an Air Combat Intelligence officer with PBV and PV squadrons during World War II. He collaborated with other members of the Naval Academy faculty on *American Sea Power Since 1776* and is the author of an article on helicopters which appeared in the July, 1943, PROCEEDINGS. He spent the past summer at Harvard University doing graduate work in economics.

gotten rich because they bought heavily into an issue "recommended by a client of their brother-in-law's broker." On the other hand, if a man will give the same thought and attention to a stock purchase that he does to buying an automobile, and "buys for the long pull," he will generally get more for his money than in any other type of investment. As it happens, ever since the collapse of the bull market in 1946, most dividend-paying stock has been selling at bargain rates, with some issues paying dividends equivalent to 10 per cent on investment.

It may be asked, why, if you can get 6 to 10 per cent on stocks, should one buy government bonds paying only 2.9 per cent? Is the risk element in conservative stocks great enough to warrant that difference? The answer is that the greater risk accounts for a large part of the difference. The rest is premium for liquidity. That is, with government bonds, you know you can receive your money back, plus interest accrued, at any time. Though you can always sell stocks, you may need your capital at just the time the market is low. Hence the insistence of every investment consultant today that you put part of your savings in "governments."

Most people after reading the *Wall Street Journal* and the *Magazine of Wall Street* for a few months begin to feel they know what they are about in buying stocks. Brokers, generally speaking, are chary in proffering advice unless it's asked for. However, though brokers are far from infallible, it's well to remember that security-buying is their business, and their views are always more likely to be correct than a layman's.

Unless an officer makes a hobby of the stock market, and is on a shore station where he can conveniently buy and sell at short notice, he does well to keep to conservative issues—the "blue chips," some of which have paid dividends annually for fifty years or more. Certain businesses are more or less "depression-proof" (as their performance in the early 1930's demonstrates). Other businesses are feast-or-famine propositions. In general, consumption-goods industries fluctuate in profits much less than heavy industry. Dividends on the stocks of tobacco companies, chain stores, dairies, and

oil refineries tend to be relatively stable. The reverse is true of those companies manufacturing steel, automobiles, building supplies, etc. In general, it is common sense for the long term investor to prefer the first to the second.

It's fine for an investor to "get in on the ground floor of a company that's going places." How often has it been pointed out that if you'd bought \$1,000 worth of General Motors in 1920, you'd be rich now, or that the original holders of one share of Coca-Cola stock have a comfortable income now from that source alone? It's well to remember too, however, how many people lost their shirts in miscellaneous motors stock of companies long since bankrupt. Some investors are going to make a good thing out of television, but it's impossible to tell now which of the many companies in the field will hit the big bonanza. (And some investors have already lost heavily on at least one company.)

Certain established industries still clearly offer growth possibilities. Chemicals are an example. This, however, is obvious to the investing public at large, and most chemical issues are (as compared to their dividend yield) relatively high-priced in today's market.

On the whole, the amateur buying for income does well to confine his purchases to established issues which have done well in the past and which will, as far as can be guessed, continue to do as well in the future. In the long run, the man who shops for a safe stock paying 6 per cent does much better than the one who buys into a new company with the hope of doubling his money in six months.

Is there an "ideal common stock" for the average small investor who, like the typical naval officer, has neither the time nor impulse to make himself an expert on the market? Such a stock would have complete price stability and completely steady dividend rate. And there is no such stock. A certain irreducible minimum of risk is inherent in equity investment.

There is a type of stock which does, in this writer's opinion, approach that ideal, however. I am merely echoing the opinion of experienced investment counsel when I



Buley. Courtesy Standard Oil Company of New Jersey

AMERICAN INDUSTRIES PROVIDE INVESTMENT POSSIBILITIES

al officers whose savings programs contain the proper amount of insurance and government bonds may find certain common stocks worthy of careful consideration.

one of the most attractive and common stock investments at the time is high grade electricity and operating companies. These pay 5 per cent to 7½ per cent dividends, little fluctuation during a depression, moreover the electric utilities are full of expansion and growth which make their stock appreciate in value. Even in times of depression their industrial production is cut down, but this is a low-rate business anyhow. Home users constitute the cream of the business. Common knowledge that the Ameri-

can home is becoming more and more electrified. (Deep freezers and television and dishwashers are only the most recent electric gadgets.)

Electric utilities enjoy local monopolies and are not subjected to the hazard of "price wars." Commission control is, from the point of view of the small investor, an advantage, not a liability. It is the policy of public utilities commissions to allow a fair rate of return after taxes. Hence any sizeable increase in corporation taxes would be compensated by higher utility rates.

Since a utility grows with the area it

serves, common sense would dictate that there is the greatest possibility of value-appreciation in the stock of utilities serving the central and southwestern parts of the United States—those regions whose population and business are increasing most rapidly.

Brokers make available to prospective investors, on request, prospectuses, detailed financial sheets, engineers' reports—in fact, all the information they themselves have available. This, plus information gleaned from such publicly published journals as the *Magazine of Wall Street* and *Barron's*, should be a sufficient guide to the small investor. The cost of investment counselling service renders it prohibitive to any but the big-time buyer and seller of stocks. Besides which, much professional investment counselling is of no value.

There are those who, concerned over the risk element in common stocks, take naturally to the idea of the increasingly popular "investment trusts"; that is, companies which sell shares to the public, and with the proceeds buy stocks. The idea is that with expert management and wide diversification, they can "insure" against loss on specific issues. Some of these trusts have had a good record, and for a certain type of investor they undoubtedly fulfill a real need. But an individual buying as little as \$5,000 worth of stock can achieve ample diversification for himself if he deals in 10- to 25-share odd lots. And the expert management of the trust naturally gets paid for its expert services.

The largest single investment most men make in their lifetimes is the purchase of a home. And even at today's inflated real estate values, it is frequently good policy for a young man settled in a community to take the plunge of mortgaging his income for years to come to provide himself a permanent abode. He gets a break on his income tax, for one thing, since not only property taxes but interest on his mortgage is deductible. Besides which, there are attractive intangibles in home ownership. However, for a naval officer on active duty, it is definitely not now a wise policy to buy real estate. (Unless, of course, he is only a year or two away from retirement and sees exactly what he wants to retire to.)

It is true that some officers have been buying at every new shore station and selling when they leave—frequently at a profit above and beyond free occupancy for two years. As long as real estate values were rising, this policy was a good risk. All signs point to realty values having passed their peak, however, particularly on old houses. For an officer to buy today in the hope of selling at a profit two years from now is to court financial disaster.

It is true that such a house can ordinarily be rented at a rate sufficient to cover mortgage payments, but, even so, absentee ownership of real estate is never satisfactory. In general, for a naval officer today real estate is the riskiest of all possible investments, hardly excluding Canadian uranium stock.

Up to now I have deliberately omitted mention of industrial and railroad bonds, building and loan shares, preferred stocks, and state and municipal securities. The return on high grade industrial bonds and building and loan shares (2½ to 3 per cent) is not great enough to put them in competition with Series E U. S. bonds, for the small investor. And they have an element of risk (however small) which governments do not have.

As to preferred stocks—in general it may be said that if a company is sound, the investor might as well share its profits without limitation; if it isn't sound, the investor wants no part of it, whether common stock, preferred stock, or mortgage bonds. On the other hand, certain specific issues at present selling at surprisingly low prices make it necessary to qualify this generalization.

Municipal and state bonds carry a very low rate of interest. They are bought mainly by wealthy investors interested in the fact that they are tax-exempt. They have little special appeal for the man whose income-tax liability is under \$10,000.

Even this abbreviated treatment of the subject, "A Naval Officer and His Money," would not be complete were the subsidiary subject, "Borrowing Money," to be entirely omitted. What if, instead of seeking to find an outlet for his surplus funds, our "typical naval officer" is trying to buy a car costing three times what he has in a savings account?

There is an easy and obvious answer to that one. Try a bank first. Many commercial banks will lend up to two-thirds of the purchase price of a car with the car itself as security, at 4 or 5 per cent interest. If you let a finance company handle it (and a finance company will, if you allow the dealer to arrange the financing), it will cost you 10 per cent or more. This fact is often concealed from you by calculating the interest charge at, say, 6 per cent, on the full purchase price—including the \$800 you have already paid "down"! As a general rule, all forms of installment buying are exorbitantly expensive.

Banks will lend money with stocks, bonds, or some types of life insurance as collateral

(Term insurance will not serve as collateral.) Some banks will make small short-term loans to depositors without collateral. Morris Plan banks will make unsecured loans at a moderate interest charge if the borrower can get co-signers for his note. And you can always get a small loan from a personal finance company if you don't object to paying 36 per cent per year (alias 3 per cent a month!).

It may seem an anomaly that when you lend money, you can get only 3 per cent interest, but when you borrow it, it can cost twelve times as much. But that, after all, is what makes saving enough never to need to borrow such an attractive proposition, for a naval officer as for everybody else.



THE NAVY TAKES CARE OF ITS OWN—AND ITS LAUNDRY!

Contributed by LIEUTENANT COMMANDER M. H. PORT, *U. S. Naval Reserve*

When operating from our base at Pearl Harbor in 1942, my destroyer, a relic of World War I, was not blessed with any laundry facilities such as were her more modern sisters. As a result, when enough dirty clothes piled up, we of the "tin can" fleet were obliged to use the laundry aboard our tender.

The strategic planners, choosing a time when I had a particularly large bundle of wash aboard the tender, ordered my ship to the Aleutian Area, and coincidentally sent the tender to the South Pacific. Retrieving laundry was out of the question.

One year later, with that particular wash written off as a loss and long since forgotten, I received a notice at my new post in Chicago from Naval authorities in Seattle. A package was being held for me and if I would but verify my present address, it would be forthcoming. Anxiously I awaited my mystery package.

A neat wooden box soon arrived with my clean laundry, reaching me in Chicago via Pearl Harbor, Australia, Pearl Harbor, Alaska and Seattle.

The Navy takes care of its own—and its laundry!

THE PUNISHMENT FITS THE CRIME

Contributed by LIEUTENANT COMMANDER W. J. MADDOCKS, *U. S. Navy*

Ship designers have, from time immemorial, been the target of more or less violent criticism from operating personnel.

In the Fletcher type 2100-ton destroyer, however, they redeemed themselves to a certain extent. In the opinion of some, this was evident in the placing of fuel-oil sounding tubes just outside of the Chief Engineer's stateroom. Should the engineers miscalculate the amount of oil they were taking on board or if they should try to squeeze in a few gallons too many, it normally resulted in the creation of a small lake of oil in the Chief Engineer's stateroom.

As is imaginable, fueling operations in the *Fletcher* class destroyers reached the maximum attainable efficiency in short order.

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS.)



Official U. S. Navy Photograph

BLIMP LANDING ON THE U.S.S. SICILY

During last spring's Caribbean maneuvers, the range and usefulness of blimps in anti-submarine warfare was greatly increased by basing them on carriers. The airships rearmed, refueled, and took on fresh combat crews twice daily.

THE FUTURE OF THE BLIMP IN THE NAVY

By LIEUTENANT COMMANDER MALCOLM W. CAGLE, *U. S. Navy*

IN MILITARY aviation, blimps have traditionally been big belly laughs and have borne the butt of as many jokes as Pat and Mike and the travelling salesman. Consequently they were never given their deserved recognition despite the fact that no ship convoyed by a blimp was ever sunk.

Actually these airborne "sea-cows" served usefully and well during the anti-submarine phases of the recent war. They didn't, true enough, get credit for sinking a single submarine; but their peculiar defensive abilities were succinctly summarized by one captured German U-boat skipper when he said: "We had orders not to attack any ship or convoy protected by a blimp."

Today, the balloons are taking a new lease on life, and there are many officers and aviators who see in their continued development a probable protagonist for the vexatious high speed submarine.

It is no secret that in the two great world wars submarines have come uncomfortably close to policing the seas. In 1917-1918, and again in 1940-1943, German U-boats almost choked off the flow of vital supplies between America and Europe. In the spring of 1943, for example, the eastern seaboard of the United States was a junkpile of wreckage blackened with oil, and the waters offshore a graveyard of ships. During the entire war, German U-boats sank, in the Atlantic Ocean alone, more than twenty-three million tons of shipping.

Our margin of victory was slim indeed, both in time and material. Our counter-attack accelerated slowly. In the first three years, the Allies sank 151 German submarines. But in the twelve months of 1943, the crisis year, the vigorous anti-submarine campaign reached its peak, and 237 U-boats were destroyed.

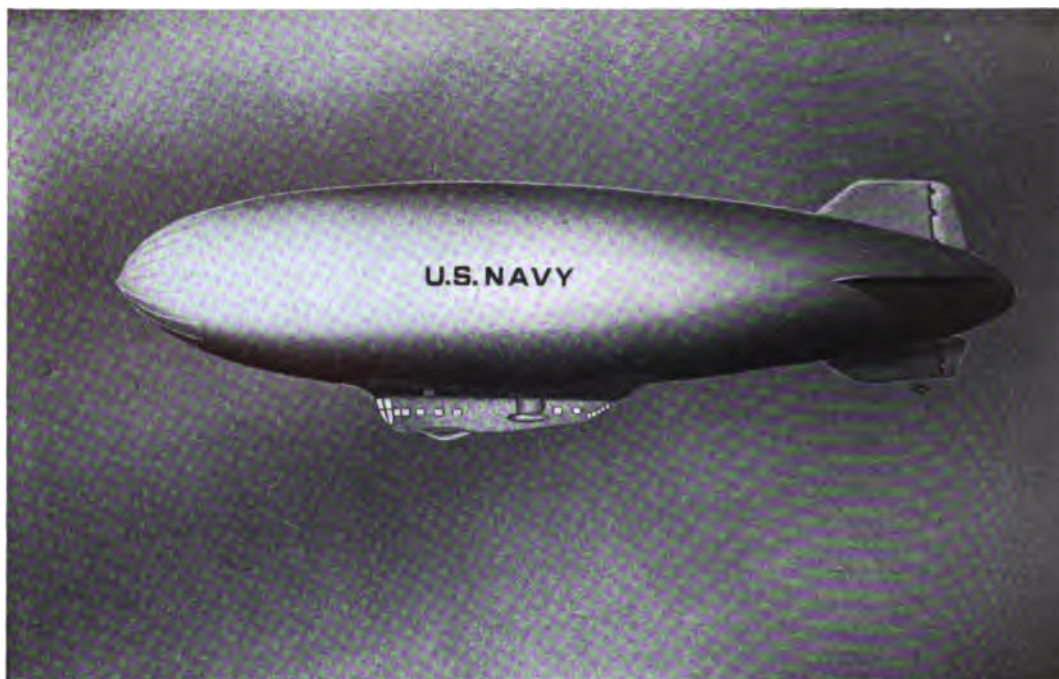
How was the victory achieved? The expenditure and area of effort were enormous. Our concentrated bombings on submarine

production centers and the submarine pens, plus mining campaigns, failed to control the menace at the source. The first mortal blows to the U-boats were fuel shortages and lack of trained personnel. The actual victory at sea was obtained by air-power—jeep carriers, and their planes, scores of patrol aircraft, blimps—plus a powerful and effective effort by our destroyers—this combination side-tracked disaster.

It was the narrowest of victories. If the Germans had succeeded in getting their now-famed U-21 "super" submarines in action (which they came close to doing)—well, the sounds and sighs of relief around Washington are still audible.

Which is basically the reason for all the ruckus over submarines today, and for the renewed consideration being given to the blimp. To use the words of John L. Sullivan who, as Secretary of the Navy, was speaking before the House Appropriations Committee: "When World War II started, Hitler had fewer than 50 submarines and he very nearly won the Battle of the Atlantic. There is a nation which has, to our certain knowledge, more than 250 submarines today. I cite these figures merely to indicate to you the degree of our interest in the development of new submarine tactics and new antisubmarine tactics." The high speed submarine is a headache which requires a new aspirin. The blimp might be the answer. The threat is so serious that no bet is going uncovered. For the moment, if airpower must control the

GRADUATING FROM the Naval Academy in 1941, Lieutenant Commander Cagle saw two years' destroyer service in the North Atlantic before taking flight training. After commanding Fighting Squadron 88 on the carrier *Yorktown* in the Pacific War, he served on the staff of Commander Air Force, Atlantic Fleet, for two years. At present he is in command of a VF squadron on the U.S.S. *Franklin D. Roosevelt*.



Official Department of Defense Photograph

DESIGNED TO COMBAT SNORKEL SUBMARINES

Above is an artist's conception of the new N-type blimp, 324 feet long, with top speed of 75 knots. This will be the largest non-rigid airship ever built.

submarine, can you name an aircraft with the ability to remain airborne for days or even weeks, which can carry a large load of bombs and a hefty array of detection equipment? The blimp is presently the only answer.

The new anti-submarine blimp, now under construction, was specially designed for sub-surface search. It will initiate a new blimp series designated by the letter "N." The N-1 will be slightly longer than either the M type or the K type—324 feet as compared to 302 and 253 feet respectively. And its helium capacity will be greater by some 100,000 cubic feet—825,000 cubic feet for the N-1 as compared to 725,000 for the M series and 456,000 for the K series. This additional size and capacity, moreover, will provide more working space, give more range and endurance, and provide better facilities for the crew. The extra helium capacity will give an additional gross lift of about 50,000 pounds.

Much thought has been given to the design of the N-1's gondola or control car.

It will be a double-decker, with the lower level designed as the operations platform, the upper level designated as living spaces. Forward to aft of the operations deck will be the bridge or cockpit for the pilots, a radio room, a large radar compartment with a formidable assortment of search and detection gear, a navigator's room, a hold, an engine room, and finally the "after bridge," designed for the gunners and lookouts. On the upper deck, forward to aft, will be an officers' stateroom (which will bunk four), a small wardroom, a crew's compartment which will berth a standby crew of 12 men, a large stowage hold, and last, the crew's galley, messhall and lounge. These compartments are neatly fitted into an over-all cabin space of 87 feet.

It is immediately apparent that this new blimp will be able to remain aloft for many days. As a consequence, its housing and living features received great attention. The galley will not be the snack bar type, but will be as fully and completely equipped as a submarine. Sound proofing and elimina-

tion of vibration have been considered. Unlike our previous blimps, the two engines on the N-1 will be housed internally in the control car. Propellers will be driven by shafting. Not only does this arrangement provide better streamlining and improve speed, but the obvious advantage of being able to secure and make repairs on an engine while airborne means that the blimp's ability to remain aloft for very long periods is enhanced. The N-1 will have ample control and power with a single engine.

The N-1 will also have other revolutionary features. For example, it will be equipped with tri-cycle and retractable landing gear. This will enable it to "take off" and "land" with a statically heavy load of 10,000 pounds. Many laymen do not understand that the cigar-shape of the blimp is also an airfoil—and when moving through air creates lift in exactly the same manner as the conventional airplane wing.

Blimps admittedly have several disadvantages. But being slow is *not* one of them. They are excellent targets (a submarine shot at least one down during the war) and they're expensive (the contract which was awarded to the Goodyear Aircraft Company was for \$1,500,000). But when the anti-sub job requires searching a vast area of sea slowly and methodically so that even a small signal can be detected—the blimp, and *only* the blimp, can do it.

The past springtime's Atlantic Command Maneuvers illustrate how blimps are already

entering the fleet picture as a valuable and productive partner. During the capture of the "enemy" Caribbean island of Vieques between 27 February and 4 March this year, two K-type blimps were used on anti-sub patrol south of the island. Working with Rear Admiral W. K. Robbins' Hunter-Killer Task Group, these blimps assisted our anti-sub planes in establishing a successful barrier which even our best and newest subs failed to penetrate. Compared with the "damage" done by these same submarines to the fleet during other phases of the exercises, the ability of the Hunter-Killer group to defend without loss the amphibious part of the operations can only give credit to the blimp's potentialities.

New ideas and projects are being considered for the blimp to improve it even more as an anti-submarine weapon. To reduce the weight of the envelope, a light, flexible metal skin is being considered. Paddle propellers—slow speed blades on the order of helicopter rotors—have been proposed for boosting top speeds. New elevator control mechanisms, similar to the yoke arrangement of large airplanes, are being investigated to eliminate the clumsy elevator wheel.

Suffice it to say that the blimp has more of a future than an aerial billboard for flashing tobacco-ad signs, or an eye-catching tow for advertisements over a football crowd at half-time. On its fragile frame and silken sac may lie the answer to a vital military problem.



THE STRENUOUS LIFE

Contributed by CAPTAIN H. E. COOK, *U. S. Navy (Retired)*

When Professor A. A. Michelson, '73, was seventy-two years old he visited the Naval Academy and lectured to the Midshipmen, telling about his first experiments in determining the velocity of light with a mirror placed near the Superintendent's office on Blake Row and a prism on the sea wall. He also reminisced, and told how he gained the nickname of "Useless Efforts," as the result of such incidents as walking the quarter deck, deep in contemplation of some intricate problem, and forgetting to send away the running boat!

Walking with him, to the Superintendent's house, after the lecture, his classmate, Commodore E. B. Underwood, said, "Mike, do you still keep up your fencing? I remember that you were Captain of our team." To which Michelson replied, "Oh I gave that up years ago, fencing was far too strenuous for me. Now I play two sets of tennis every afternoon!"

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS.)



Official U. S. Navy Photograph

U. S. HOME FLEET IN THE DAYS OF SAIL

Forseeing the future of steam, Secretary Upshur recommended special engineering studies and scientific research and development.

ABEL UPSHUR, FORGOTTEN PROPHET OF THE OLD NAVY

By DR. DONALD W. MITCHELL

OF the numerous men who have held the highest civilian position in the United States Navy probably no other one offers so much that is both contradictory and highly interesting as Secretary Abel Upshur.

Upshur's background was usual enough for the American politician of the first half of the nineteenth century. Born in the Old Dominion in 1790 of well-to-do parents, he was educated at Yale and Princeton, later practiced law with considerable success, served in the Virginia Legislature for several terms, and held a judgeship. At an 1829 constitutional convention in Virginia he was an outstanding leader in an assemblage that included, among others, James Madison, James Monroe, John Marshall, John Tyler, and John Randolph. His political views and abilities were typical of his time and environment. They were essentially those of a conservative. Upshur opposed government regulation of banking, tendencies in the direction of increased power by the Federal government, or increased control of the government by the common people. The South with its institution of slavery, its dependence upon agriculture, and its conservatism in the social and political spheres seemed to him the perfect balance wheel of a nation otherwise too radical and too much inclined toward industrialism. Prior to 1841 he had received recognition as an able lawyer, a forceful writer, and a logical and persuasive speaker. If background had any meaning, President Tyler in choosing Judge Upshur had insured the United States Navy of sound and conservative but unimaginative leadership. Support of naval and territorial expansion might be expected, but not much else.

Strangely the new Secretary of Navy did not fulfill such reasonable expectations. In the new field of naval leadership Abel Upshur abandoned his political conservatism and almost overnight became an ardent re-

former. After less than a year in office he wrote in his 1841 Annual Report:

That reform is necessary, in every part of our naval establishment, is on all hands admitted; and it is a subject of general regret that it has been so long delayed. The delay has been in the highest degree injurious to the service, and is daily rendering reform more and more difficult as it becomes more and more indispensable.

The conditions which caused this overnight shift in viewpoint were serious enough to attract national attention. Following its splendid achievements in the War of 1812 the Navy had gotten rusty. Of some seventy vessels only about twenty were kept in commission and these were scattered about the globe on the Mediterranean, African, North Atlantic, Brazil, Pacific, and East Indies stations. Half of the ships-of-line the Navy boasted had been on the stocks since about 1816 (some remained there until the Civil War) and had rotted without ever having been launched. While its relative strength had been somewhat augmented since the Napoleonic Wars, the British Navy had approximately eight times as many ships, and the French Navy five, while at least four other navies were superior in number of ships.

The human side of the Navy, too, was deficient in many ways. Promotion was slow

DR. MITCHELL received his Ph.D. from the University of Southern California, his thesis being on naval history. Winner of a Knopf Literary Fellowship in History, he published his *History of the Modern American Navy: 1883 through Pearl Harbor* in 1946. During the war he was military analyst of *The Nation* and contributing editor of *Current History*. The author of over 150 articles, mostly on military subjects, he is at present writing a *History of the New York Quartermaster Purchasing Office* for the Department of the Army.

and mechanical, and the lack of any system of demotion brought rum blossoms and dullards to high rank as regularly and rapidly as high grade officers. Many of the former were stationed ashore "awaiting orders" on full pay, sometimes for years, while their abler and more diligent comrades carried on in active and arduous service. There were then only three recognized ranks: lieutenant, commander, and captain. No remotely adequate system of naval education existed, either for commissioned or enlisted personnel. The latter, in fact, occupied a somewhat degraded status. The better paying Merchant Marine skimmed the cream from the supply of the country's sailors and left to the Navy a motley aggregation of foreigners, incorrigible boys, and regular sailors. Ashore the Navy was less efficient than at sea. Its organization had drawn criticism for years. Procurement was wasteful and unsystematic. Sometimes it was also graft ridden. Mr. Meriwether of Georgia had but recently protested in Congress that out of moneys appropriated for medicine no less than \$4,000 was spent on frock coats, whiskey, stationery, etc., bought from favored suppliers at approximately *twice the market price*.

For these unfortunate conditions no one individual was especially responsible. The United States Navy had simply not been subjected to any pressures, either military or civilian, strong enough to make it progress with the times. Meanwhile steam had been introduced into shipbuilding, more powerful artillery was being developed, and iron armor, torpedoes, mines, and the first submarines lay just ahead. The Navy was, in short, on the verge of a technological revolution which would shortly make the ships of the 1830's as obsolete as the galleys of the ancient Greeks.

As soon as he became Secretary, Upshur started a fight for more and better naval power. At that time the United States was having one of its periodic war crises with Great Britain and he made the most of the political situation to obtain larger appropriations, new ships, more old ships in commission, and a larger personnel. In special pleas to Congress, as well as in the strongest and best-written annual reports to come from

any American Secretary of Navy, he proceeded to make a strong case for immediate and marked expansion.

The arguments used for more ships were based partly on the territorial expansion that he hoped would shortly take place, and partly upon the possible threat of other nations. American interests in the Pacific were rapidly growing. In view of their distance from the United States these interests could only be safeguarded by sea power. In commerce the United States had three times the stake of France and more than half of that of England. Yet the American Navy was insignificant in comparison with either. With considerable penetration he observed, "Wars often result from rivalry in trade and from the conflict of interests which belong to it." In such conflicts he contended that the Navy necessarily played the decisive role, and moreover, by its power to redress injuries, made their occurrence highly unlikely. Should war come, it was far preferable to meet the enemy at sea rather than to rely on either coast defenses or the regular army.

Like many a later big navy man, Upshur felt that the question of what was an adequate navy could only be answered with relation to the force of enemy navies. In this regard he was far in advance of the professional Board of Navy Commissioners, which had in previous years requested as large a navy as could be quickly manned in the event of an emergency—a highly indefinite standard. As European fleets were expanded, the position of the United States Navy became less secure. He reckoned that a foe would necessarily have to leave a portion of his fleet at home, and the remainder would be weakened to some extent by distance from bases. Therefore, the United States by maintaining a fleet half as large as that of any likely opponent (i.e., England) would be able to retain command of the sea in her own waters. It followed that the existing navy should rapidly be augmented.

But what form was war likely to take?

In answering this question the Secretary of Navy saw well ahead of his time. He reasoned that actual invasion of the United States was hardly likely. However, the United States was composed of many, diverse, and in some instances mutually

hostile elements. What then was more likely than that an enemy would seek by ideological means to array these potentially hostile elements against each other?

A war between the United States and any considerable maritime power . . . would be a war of incursions aiming at revolution. The first blow would be struck at us through our own institutions. No nation, it is to be presumed, would expect to be successful over us in a fair contest of arms upon our own soil, and no wise nation would attempt it. A more promising expedient would be sought in arraying what are supposed to be the hostile elements of our social system against each other.

But this was not the only way he envisaged a future war. At this day many Americans argued that the shallowness of American harbors and coastal waters offered a great deal of protection as enemy ships-of-the-line had too great a draught to permit close approach. Upshur denied that shallow waters would offer protection in the future. Steam power plus improved naval artillery had destroyed such fancied security.

Steamboats of light draught . . . may invade us at almost any point of our extended coast, may penetrate the interior through our shallow rivers, and thus expose half our country to hostile attack.

He also prophesied that these comparatively small vessels might be carried to their scene of activity in mother ships—a prophecy realized with midget submarines exactly 100 years later!

But Upshur was prophetic from another standpoint. The ships of the Navy were in 1841 scattered singly or in two's and three's at various points throughout the world. In case of war the United States would be highly vulnerable to a sudden attack which might come before the outlying squadrons could be recalled. He therefore took advantage of Congressional fears of war with Britain to secure a special appropriation for the commissioning of a permanent Home Fleet which included some of the Navy's strongest vessels. This fleet, representing the important military principle of concentration of force, was—as the Sprouts have pointed out in their excellent *Rise of American Naval Power*—the direct ancestor of the North Atlantic Fleet of the 1890's, the At-

lantic Fleet of the early 1900's and the United States Fleet of today.

The few quotations given reveal that Upshur was prophetic to an amazing degree. "Steamboats of light draught" in the form of gunboats and monitors, though not then built or even conceived, operated in the South during the Civil War in exactly the way that Upshur foretold. In stressing the economic nature of war he was foreshadowing a host of later students, including Karl Marx. In noting the true role of sea power and the importance of concentration of force he was, perhaps almost accidentally, anticipating Mahan. In observing a supposed weakness of the United States to civil war, revolution, and opposition between social classes he might almost have been foreseeing the views of Adolf Hitler.

Upshur's expansionist policies for the Navy also took another turn. Merchant Marine and Navy in his view went together. Therefore the government might profitably subsidize the building of large passenger steamers to operate on strategically important though not necessarily financially profitable runs. These steamers would be constructed according to naval specifications and made available to the fleet in the event of war.

Strongly "big navy" as he was in his thinking, the Secretary was even more interested in the improvement of the existing fleet than he was in its increase. His orderly legal soul was completely outraged by the status, or rather lack of status, of naval law. At that time the Navy was governed by some very sketchy and general rules and regulations which had been adopted by Congress in 1800. In 1815 the Board of Navy Commissioners had compiled "Rules, Regulations, and Instructions for the Naval Service of the United States." This was known as the *Blue Book* and had been in force for 23 years but had never been formally adopted or accepted by Congress. The legal status of the *Blue Book* hence rested on custom alone.

The lack of system in departmental organization likewise exasperated the new Secretary. In that day the Navy ashore was a comparatively small but complicated and badly run piece of machinery. The Secretary ran the Navy with the aid of a five-officer

Board of Navy Commissioners and a handful of civilian clerks. The arrangement of duties was confused, contradictory, and meaningless. Administrators found it difficult to get direct information regarding any branch of the service.

Upshur's urging proved effective, and Congress early in his administration passed an act creating the bureau system. The Secretary was not altogether pleased with the results, as the House of Representatives had insisted on amendments which in many instances placed unrelated subjects under the same bureau. Ordnance and hydrographic surveys, for instance, were grouped together under the new system.

Despite numerous limitations the bureau system was a definite and marked improvement in naval administration. Under the new system the Secretary found it easier to effect reforms by personal action. The Hydrographic Survey and National Observatory were placed under the brilliant Lieutenant Matthew Fontaine Maury. Procurement was greatly improved by such routine reforms as buying directly from producers of goods and carefully inspecting everything purchased. Previously dealers had often palmed off on the Navy the worst goods they possessed. Copper for ship's bottoms which should have lasted for twenty years was found useless after seven. When removed, it was characterized by a honeycombed appearance caused by impurities which had corroded and fallen out.

Realization of the necessity of testing goods offered by sellers led to a further reform. In order to analyze the copper offered it by dealers, the Navy necessarily had to call in experts. It therefore hired Professor Walter R. Johnson of Philadelphia. This scientist tested iron and copper offered, and greatly improved chain cables by use of the thermotension process. Tests were also made to determine the qualities of various kinds of coal.

In such activities Abel Upshur was blazing a new trail by being the first Secretary of Navy to employ expert civilian aid in the solution of naval problems. In his Annual Report for 1842 he warmly defended this departure from precedent. Contending that it was less costly to learn from experimentation

than experience, he concluded by urging additional money for the widespread extension of such activities. As a starter he wanted to build a laboratory and employ in constant research one chemist and one pyrotechnist. He felt the latter might be useful in preparing fuses and in manufacturing new types of rockets.

The experiments which have already been made under the direction of this Department, have imparted to it a degree of information which could not have been derived from any other source, and which will more than repay their cost, in the building of a single ship. These experiments, however, are but the beginning of what might be accomplished in the same way.

It is hardly necessary to state that it required the emergency of World War II to bring about the mobilization of civilian scientific minds urged by Abel Upshur a hundred years earlier.

Any man with Upshur's keen appreciation of science could scarcely help being a critic of many of the ships then in the Navy. The splendid workmanship that produced frigates like the *Constitution* and the *United States* had degenerated in later years with the result that the Navy had gotten some very bad vessels. In a special report to Congress just after coming into office Upshur noted, "Many of our recently constructed men-of-war have been defective and some of them monsters of deformity." He suggested as a remedy the thorough trial and testing of existing ships and reproduction of the best ones.

By the end of the year his views had altered and grown more modern. He came to realize that naval architecture was in a state of flux with steam rapidly coming into the picture. In 1841 the Navy had only one experimental steam vessel with two others, the side-wheel steamers *Missouri* and *Mississippi*, under construction. These two, intended to displace 3,220 tons, were for their day large ships. Their construction had been opposed by Secretary Paulding and the vast majority of naval officers who disliked steam ships because they were dirty and noisy. However, Congress—in this instance more farsighted than either naval officers or the Executive Department—had authorized



From an Old Print

THE BURNING OF THE *MISSOURI* AT GIBRALTAR IN 1843

When Upshur became Secretary of the Navy, the *Missouri* and *Mississippi* were the only steamers under construction for the Navy, and there was only one experimental steam vessel on the active list.

them together with a third steam vessel. After being commissioned, the *Mississippi* and *Missouri* suffered from one vital defect. Their paddle wheels amidships forced the placing of their machinery above the water line—an obvious feature of vulnerability, as the foes of steam were quick to point out.

At this early date only the more farseeing and courageous officers dared support steam warships. This small group was afforded strong support by the Secretary of Navy. To design the *Princeton*, third of the steam warships, Upshur selected Captain Robert F. Stockton. The latter had been much impressed with the inventions of John Ericsson, and for the *Princeton* accepted a submerged screw propeller at the stern. This innovation made the *Princeton* the first screw warship in any navy, completely answered the strongest argument of the enemies of steam,

and temporarily gave the United States Navy an advantage over all others in design. The *Princeton* also incorporated certain marked improvements in her ordnance.

But Upshur's desires for innovation went further. In 1841 he recommended an experimental vessel to be *built entirely of iron*. This ship should be of moderate size "sufficiently large to afford a fair test, without exposing too much to the hazard of failure." With a canny eye to local politics and to help pave the way for so radical an innovation, he suggested that the building of such a ship would give encouragement to needed branches of home industry. The result was an appropriation of \$250,000 for a small coast defense ship, the *Stevens Battery*. Unfortunately, she was premature and never completed. Later naval leaders, lacking Upshur's vision, failed to push construction of ironclads with

the result that the United States entered the Civil War with an all-wooden navy.

Despite willingness to experiment with new kinds of ships, Upshur proved unable to think clearly regarding the entire naval problem of the United States so far as it related to ships. His official papers reveal that he grasped, at least dimly, the importance of command of the sea and envisaged an American fleet preventing invasion by defeating the enemy at sea. Yet he was unable to realize that the battleship or its 1840 equivalent was the craft best suited to meet and defeat this hypothetical enemy. Thus in his 1841 Annual Report he urged, besides experimental vessels, the building of more frigates, brigs, and sloops, which could be constructed more cheaply than line-of-battleships. If Upshur's strategic ideas were far in advance of his time, the same thing could not be said of his tactical concepts. The result was a kind of hybrid naval policy which on one hand anticipated Mahan, on the other borrowed from Jefferson and his defense by cheap gunboats.

In the field of personnel administration, Upshur dealt with numerous and complicated problems, many of long standing. By 1840 numerous issues connected with naval education, promotion, and retirement had been agitated for years. In seeking solutions he was in some cases original. In others he merely helped along progressive movements already under way.

An instance of the latter kind concerns Annapolis. Upshur in 1841 urged the establishment of a naval academy for the education of midshipmen. In so doing he was merely repeating—though with greater cogency and force—recommendations made at intervals since 1814 by other secretaries. Until an academy was established he urged that the itinerant professors of mathematics, who then constituted the only educators in the Navy, be given higher rank and pay. In an extremely eloquent passage in his 1842 Report he set forth the case for education:

The cadet from West Point enters the army well founded in the principles of solid and useful learning and fully prepared to engage, with advantage, in any pursuit, whether of civil or military life. The candidate for the navy, on the contrary, is deemed well enough qualified, if he be able to read

and write, to answer a few simple questions in English grammar, and to solve plain problems in the elementary rules of arithmetic. Why should this difference be made? Important as a proper preparatory education may be to an army officer, it is even more important to an officer of the navy . . . he is the most frequent representative of his country abroad—the standard by which foreign nations will be most apt to judge her moral and intellectual character. He is, also, frequently intrusted with important and delicate negotiations, involving the rights of our citizens, and the peace and honor of our country. The function of the naval commander is much more useful, important, and dignified than is generally supposed. To his skill and vigilance are intrusted . . . the safety of the ship, and the lives of her crew. The honor of his country's flag, and in a great degree, her harmonious relations in peace and her protection in war, are among the awful trusts with which he is clothed. Very few men can be found, qualified in every respect, for so high and imposing an office; and unhappily, there are too few among them who duly feel its importance and dignity. I humbly think that it is a high duty of Government to adopt every means calculated, in any degree, to elevate the standard of character in the naval commander, and to fit him in knowledge, in professional skill, and in personal character to discharge the high and solemn duties of his office. This can be best done by giving him a suitable preparatory education, and by providing proper and ready means of removing him from the ranks of his profession whenever he may be found unworthy to occupy a place in them.

This far many of the better naval officers of the day were ready to go. But Upshur went beyond both his professional advisers and the lay public. In 1841 he correctly pointed out that:

The use of steam vessels of war will render necessary a different order of scientific knowledge from that which has hitherto been required. . . . Engineers will form an important class of naval officers. It will be necessary to assign to them an appropriate rank, and to subject them to all the laws of the service. Great care should be used in the selection of them, because a great deal will depend upon their skill and confidence; hence it is necessary that they should pass through a prescribed course of instruction, and that the Government should have the proof of their competence which an examination would afford. This important object can best be obtained by the establishment of naval schools, provided with all necessary means of uniting theory with practice.

In making this recommendation in 1841 Secretary Upshur was approximately *two generations* in advance of practice in the United States Navy. As recently as the early years of the twentieth century the status of engineers in the Navy aroused intense controversy. The abler Annapolis graduates sought to avoid engineering, and for several years very few men were trained in the field. As a natural result there was a series of disasters which cost many lives. After the worst of these, the loss of fifty men on the gunboat *Bennington*, a young engineer officer facing court-martial told his defender: "I know very little about engineering. *I never stood a watch in an engine room before I was made chief engineer of this ship.*"

In dealing with other problems affecting personnel, Upshur was fated to change his position sharply and within a short time. Two problems faced by any military organization proved especially troublesome. Briefly stated they were: (1) how to assure the rapid advancement into positions of responsibility of the Navy's best personnel; (2) how to eliminate undesirables.

These problems Upshur approached from a viewpoint very friendly to the officers of the Navy. In his Annual Report for 1941 he noted that many officers were inactive, and he urged the commissioning of more ships to keep these men busy as well as to increase the Navy's striking power. He also argued forcefully for the creation of more grades, stating that the three regular grades of lieutenant, commander, and captain were altogether inadequate, and comparing them unfavorably with the nine ranks in the Army. The lack of any grade higher than captain worked to the disadvantage of the United States in international intercourse.

A year later Upshur saw personnel problems through somewhat different eyes. While not retreating from his recommendations for more and higher grades in the Navy, he had become mainly interested in removing from the service the "relatively small number of officers who do no credit to their commissions."

The reason for this metamorphosis is not hard to find. In 1842 the United States Navy passed through one of its greatest scandals. The small brig *Somers*, passing through the

West Indies en route to the African station, contained two officers fated to become very well known. The first was the captain, Commander Alexander S. Mackenzie, a hard-bitten martinet of thirty years' service. The other was a young midshipman, Philip Spencer, wayward son of the Secretary of War. Aided by gifts of liquor, tobacco, and money young Spencer made friends with several members of the crew to whom he gradually unfolded a plan for seizing control of the ship, murdering the officers and part of the crew, and embarking on a life of piracy. Eventually Spencer confided in the purser's mate, James W. Wales. With some difficulty Wales got word to Commander Mackenzie. Though at first incredulous, the latter arrested Spencer and some associates and found documentary proof of their guilt. He then became fearful because he did not know how far the plot extended. A council of his officers was called and advised the hanging of Spencer and two confederates. Wisely or unwisely, Mackenzie took this action.

When the *Somers* arrived in New York with the news, a thrill of horror swept the entire country. Both Navy and public quickly divided into pro- and anti-Mackenzie camps, and pamphleteers did a big business. A Court of Inquiry composed of Commodores Stewart, Dallas, and Jones upheld Mackenzie. However, Secretary Upshur, shocked by the lack of legal procedure, brought charges of murder against Mackenzie. At the resultant court-martial James Fenimore Cooper, naval historian, aided the prosecution. The court-martial, nevertheless, exonerated Commander Mackenzie after considering all evidence.

The *Somers* case provided a forcible illustration of two of the Navy's serious personnel weaknesses. One lay in the lack of care to see that the Navy's midshipmen were well educated and indoctrinated and of good type. The remedy to this situation was a preliminary period of theoretical and practical study during which the would-be midshipman must clearly prove his good conduct, capacity, fitness, and physical ability. Out of this group Congress could then appoint acting midshipmen whose commissions would be made permanent following a successful year at sea.

The second problem was that of getting rid of older officers who had become incompetent. To accomplish this Upshur suggested a retirement or furlough system on reduced pay. The Secretary of Navy, either acting directly or through a board of naval officers, should have the power to nominate officers for retirement, giving the reason in each case. To serve as a check against abuse of power the Senate might have the power of reviewing such cases.

These two suggestions are intensely interesting because each was later, and with modifications, carried into effect. Annapolis operated as precisely the type of check on new midshipmen that Upshur had wanted. The suggestion for getting rid of incompetent officers, though fiercely resisted and debated for several years, finally resulted in the creation of the Retirement Board. This body, better known as the "Plucking Board," was later accused of cutting into good material. Nevertheless, in its earlier days it terminated the naval careers of some officers who added nothing to the good name of the service. Furthermore, as Upshur foretold in 1842, it tended to give a higher tone to the service:

The belief, hitherto prevailing, that an officer of any standing (in the Navy), could not be driven out of it . . . has had a strong influence in ruining its discipline and corrupting its morals and manners. The furlough system, firmly administered, will serve to remove this impression; and with the assistance of an unsparing and impartial administration of the law, through courts-martial, will soon purify the service and keep it pure. . . . The necessity of some mode of proceeding, by which the Navy may be rid of the incompetent as well as of the guilty is universally admitted.

Upshur was also interested in the enlisted personnel, whose state he felt was greatly in need of improvement and could be improved only by making conditions aboard ship more endurable. However, his thoughts on this subject were slow in taking tangible form, and his responsibility for the abolition of flogging, improvement of the mess and naval hospital facilities, and other reforms is, no more marked than that of certain other secretaries.

On the subject of naval bases Upshur presents a contradiction, with views that were in some ways broadly prophetic, in others very

limited. Pointing out the increasing interests of the United States in the Pacific in whaling, trading, and settlement, he urged that the Gulf of California be thoroughly surveyed, that American forces in the Pacific be doubled, that a naval base be established on the Pacific coast and a naval station at Hawaii.

In another naval base venture Upshur was less far-sighted. In a laudable effort to make the Navy a more truly national institution he extended recruiting to the Middle West—with good results. He also recommended a naval base in the lower Mississippi Valley, partly to provide a government market for some of the products of the region. Such action was, of course, merely a continuation of the prevalent but unsound practice of establishing bases for political reasons. The base was built—at Memphis—and provided the needed market. However, it was so poorly situated and generally useless for naval purposes that Secretary Bancroft a few years later put an end to it as a valueless expenditure of national funds.

Upshur's naval career was terminated in the fall of 1843 when he was promoted to the position of Secretary of State. However, his interest in the Navy continued, and he gladly accepted an invitation for February 28, 1844, to be present at the trial of the new *Princeton*, whose main gun, the "Peacemaker," could fire a 225-pound shell. As part of a gala party he witnessed the behavior of the ship and its artillery, then retired to an official banquet. As the meal was finished, word was sent to the notables that the "Peacemaker" was to be fired once more. Upshur rose and, indicating the empty champagne bottles with a cheery "Let them remove the dead men," climbed to the main deck to watch the firing.

Once more the "Peacemaker" spoke—with tragic results. The huge cannon burst. Seldom has such a calamity claimed more eminent victims. Killed instantly were Secretary of State Upshur, Secretary of Navy Gilmer, Commander Kennon of the *Princeton*, President Tyler's father-in-law, the American minister to Holland, and two seamen. Many others, including Commodore Stockton, were wounded but recovered.

Among our Secretaries of Navy it is not

altogether easy to assign Abel Upshur's rank. He served for only two years in time of peace, died suddenly and tragically, and was soon forgotten. Moreover the American Navy, in the forty years which preceded the Civil War, had other able civilian leaders, some of whom bore more responsibility for certain reforms than did he. Yet even in the face of strong competition Upshur is still a secretary of great stature. In his dealings with Congress he was able to get greatly increased appropriations for the Navy in spite of able and well-entrenched opposition. Moreover, he evolved a definite philosophy of seapower and a sensible and definite naval policy based on the realities of international politics and America's strategic position. As an administrator he proved himself to be an excellent judge of men and a powerful foe of both Congressional inertia and service conservatism. In naval law and naval organization, both ashore and afloat, his contributions have lasted—with changes—to the present day. He fathered the first successful steam vessel in the United States Navy and secured the authorization of the first iron warship. Upshur also aided greatly in the evolution of a system for ridding the Navy of its commissioned deadwood. He also gave

an impetus to naval education. Naval procurement he made more efficient and honest. To a greater extent than any of his immediate predecessors or successors, he employed scientific research to help the Navy in solving its problems. And he did all of these things *within a two-year period.*

But even these immense contributions do not fully measure Upshur's greatness as a Secretary of Navy. In the type of vision, which lifted Department organization out of chaos, for forced retirement of the unfit among commissioned personnel, for seeing that goods procured by the Navy were of high grade and reasonable price, the country is indebted in large measure to Upshur. The more forward-looking officers of his day could thank him for supporting every movement looking toward reform and improvement. But this was only a partial and inadequate measure of his greatness. In the type of vision that foresees the future to the extent of twenty, sixty, even a hundred years, and seeks to guide development accordingly, Upshur was far ahead of any other man of his day, either in or out of the Navy—one of the most brilliant and far-seeing civilian chiefs that the United States Navy has ever had.



THE MEN WHO CAME TO DINNER

Contributed by LIEUTENANT COMMANDER H. B. SEIM, *U. S. Navy*

In the Hoover era, the U.S.S. *Arkansas* was at one time ordered to San Francisco so that the President might take passage in her to the east coast. Although the projected voyage never materialized, plans had progressed to the point where pre-embarkation festivities were in order. One of the more prominent hostesses of Palo Alto honored the officers of the *Arkansas* by extending to them, through the Fleet Commander, an invitation to attend a party given for the President. The party was to follow a small private dinner to which the officers were *not* invited.

In the interests of punctuality, the Fleet Commander advanced the "time of reporting" given in the invitation by a liberal amount before passing the information about the party to his next junior. As the invitation filtered step by step down the chain of command, each stage was marked by a similar advance in time, as a result of which the officers invited to the after-dinner party arrived fully an hour and a half early.

The embarrassment and discomfort of the officer guests, innocent victims of this "super-efficiency," was equalled only by the icy tone of the hostess as she greeted them. "Gentlemen, if you had been invited to dinner, you would have missed three courses already. *But nobody here invited you to dinner!*"

(*The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS.*)



Official U. S. Navy Photograph

PHOTOGRAPHS AND CHARTS ARE INVALUABLE—BUT THEY ARE NOT STRATEGIC MAPS!

What the strategist needs is a map to give him the facts on geography, hydrography, maritime, military, and aviation establishments, transportation, meteorological data, and a host of lesser details.

A NEW MAP FOR STRATEGISTS

By CAPTAIN CHARLES A. BOND, *U. S. Navy*

THE ADMIRAL stepped to the deck of his flagship late that night. He found the Chief of Staff and several others of his assistants waiting for him. From the manner in which they accompanied him to his cabin, it was obvious that something serious had happened. While walking up the deck they told him that the long expected crisis had arrived, and dispatches were already coming in. The first half of the really important one had been decoded and it was apparent that the Admiral was to form a task force and get underway in a hurry—but not to the expected place.

At dawn they were on their way. Other units joined them until an imposing force of ships was headed for the objective. After breakfast the Admiral ordered a meeting of the staff. His cabin was in disorder; there were charts and books everywhere. It was manifest that he'd been up all night going over the situation, and it was equally clear that he had found it necessary to refer to dozens of reference works. Here was the navigation chart of the area; there an Air Force planning chart; a National Geographic map; and several volumes of Encyclopedia Britannica. There were intelligence reports and summaries; bulletins; and even a copy of *Life* open at an article on this area.

The material was available, little nuggets of it here and there, each of them important but none of them joined together in proper relation to the whole. They were scattered all about the cabin—and when the Admiral began discussing how the Task Force would enter the Straits and commence operations inside . . . the fun began. No one could remember the answers to such questions as: Would that harbor take a carrier? Was this beach satisfactory for an amphibious landing? Is this spot a bomber field or an emergency landing field? What section of that railroad offers the best target? Can we get those mountains on the radar as we pass through the Strait? These were all catchy but legitimate questions that

needed to be answered as the conference rolled on, and the answers were right there in the cabin—but it took far too long to assemble them or even locate them. And once assembled, it was a difficult task to present a complete picture of the problem. The Admiral exclaimed a half dozen times, "Why can't we put all these blasted facts together on one piece of paper?" What he wanted was a new kind of map.

Forty-four hundred miles away the General had been called back from his game of golf. *His* dispatches were coming in, too. His problem was a matter of strategic bombing and close work with the naval forces already underway for the target. But technical knowledge of the area was as hard to dig up as it had been for the Admiral. Of course he had the intelligence—it had been G-2'ed to the limit, but the essential material must be collected from a dozen different sources. To get an overall strategic picture of what it was about? No flux! The best that could be done for each command was to dig it out for himself and record it as clearly as possible on one of the few large maps at hand. Likely this map was already cluttered up with a lot of irrelevant information and the projection was distorted. . . . Well, it just didn't suit the purpose at all.

Now let's leave these hypothetical characters sweating it out as best they can and turn to meet the problem under consideration, the Strategic Map. What is it that these unhappy warriors require to help them make

A GRADUATE of the Naval Academy in 1925, Captain Bond has since performed various types of duty all over the world, including Operation Highjump to the Antarctic in 1946 and duty in the Operations Section of the Chief of Naval Operations. He has recently completed the Strategy and Tactics Course at the Naval War College, and is now a member of the War College Staff.

their important decisions? Is it possible to provide them with a really good strategic map? I think so.

What should this map contain? Right off, we should stress the difference between the needs of the strategist and the tactician. The strategic map should be one wherein are presented the broad facts of a strategic nature, plotted in their proper relations to each other. All non-essential details should be excluded. From the definition of strategy, this map should assist the commander in the science of concentrating an effective force at a given place and time, and should assist him in maneuvering on a broad scale the forces under his command.

Broadly speaking, strategic information may be placed under the headings of (A) topography, (B) hydrography, (C) meteorology, (D) communications, (E) economics, (F) political factors, (G) scientific factors, and (H) sociological factors. Obviously it would be impossible to display all these factors on a single map, but this information should be available in supplement so as to understand properly the strategic situation.

It might be argued that naval charts provide all the strategic or operational information needed for the seaman. This no longer is true. Operations today are sure to involve all three services—if not immediately, then eventually. Even the statesman is implicated.

Much of this information may be placed on a map without cluttering it, by wise use of symbols, map-size insert maps, written descriptions, and in certain cases, overlays. It is not just an intelligence map, nor an aviator's map, nor a surface nor subsurface navigator's chart; nor a railroad or automobile map, nor a terrain map for the infantryman or artilleryman, but a map for the commander, the statesman, and the student. It should also help to present the intelligence summary, with the current intelligence superimposed, if needed.

Here, then, is the information that should be found in this map:

- (A) *Geography*: (on a relatively broad scale, naming important objects only)
- (1) Coastlines.
 - (2) Significant rivers, lakes, waterways.
 - (3) Contours and altitudes.

- (4) General character of terrain, such as marsh, desert, jungle, or cultivated areas, in order to display trafficability.
- (5) Cities and towns.
- (6) Land ice (permanent).
- (7) Major political boundaries.

(B) *Hydrography*:

- (1) Water depths, indicated by shading at 5, 10, 20, 100 and 500 fathoms (thus indicating suitable depths for amphibious, submarine, mining, and task force operations). Individual soundings for important controlling depths only.
- (2) General ocean currents and exceptional tidal conditions.
- (3) Limit of radar range from shore to seaward, to indicate where a ship may use radar to fix a position and when it can be observed by radar from ashore.

(C) *Maritime establishments*:

- (1) Bases, large, medium, and small, with controlling depth of water.
- (2) Base facilities: repair, fuel, drydocking, and cargo handling.
- (3) Anchorages, large or small, with controlling depth of water.

(D) *Military establishments*: (permanent only)

- (1) Fort, camp, command post.
- (2) Depot, dump, staging area.
- (3) Fixed defenses, line or area.

(E) *Aviation establishments*:

- (1) Airfields: heavy, medium, fighter or emergency, with capacity of field in type, and fixed facilities.
- (2) Seaplane base: ramp, alighting area.
- (3) Air depots.

(F) *Amphibious*: (for operations of BLT or larger only)

- (1) Suitable approach areas.
- (2) Beaches: capacity to receive.
- (3) Beach exits: trafficability and gradients.

(G) *Transportation*:

- (1) Railroads: marshalling yards, tunnels, bridges, shops, and stations.
- (2) Roads: bridges, tunnels, critical stretches.
- (3) Navigable inland waterways.
- (4) Transportability of terrain.

(H) *Major strategic targets:* (beside those mentioned above)

- (1) Power: vital generating plants.
- (2) Fuel: refineries, wells, pipes, and tanks.
- (3) Target systems as designated.
- (4) Magazines: ammunition, chemical warfare, atomic bombs.
- (5) Guided missile launching sites or areas.
- (6) Radars: fixed and permanent.
- (7) Shipyards and port facilities.

(I) *Insert maps and tables:*

- (1) *Meteorological data:* (for main seasons)
 - (a) Gales, visibility, fog, cloud cover, temperature.
 - (b) Winds: direction and velocity.
 - (c) Waves and surf (for amphibious landings).
 - (d) Icing (for aviation).
 - (e) Sunrise and sunset tables (approximate only).
- (2) *Distances:*
 - (a) To important places off the map, airline, ground and sea.
 - (b) Distances between important places on the map, with space for additional figures desired.
- (3) *Blow-ups of important bases or areas:* (such as Norfolk area)
 - (a) When important to show details.
 - (b) When main map is too crowded.
- (4) *Shipping and air routes.*
- (5) *Relation of subject area to surrounding areas,* with surrounding map identifications, and index of more detailed and specialized maps for further reference purposes.
- (6) *Hydrographic:* (supplemental)
 - (a) Water temperatures, summer and winter.
 - (b) Sound conditions (for ASW).

(c) Temperature gradients.

(d) Sea ice: limits and types, by seasons.

(7) *Time zones.*

It is again emphasized that only objects of interest to the modern strategist should be shown. Not every railroad is important, nor is every bridge or tunnel, hydroelectric dam, or power plant. If more detailed information is desired, let the navigator get out his charts and the intelligence officer his survey or encyclopedia. This is not the place for temporary dispositions such as portable radars, camps, troops, aircraft, or mobile artillery; however, space should be available to use it as a situation map if desired, by marking up the map, colored pins, overlays, etc. Not all the cities need be named, but densely populated areas should be indicated. The map must have on it proper definitions, interpretations, and legends, and on its reverse side sufficient data to describe the area more fully, such as one may find on the reverse of pilot charts of the ocean areas.

To give the best presentation of time and space, the Lambert conformal conic projection is recommended. Meridians and parallels should be indicated but not allowed to interfere with the main items. Compass roses should be used sparingly, if at all. The map should be carefully colored and shaded to give emphasis to prominent items, and yet maintain a clear overall picture.

The duties of the planners and the Fleet Commanders are vastly more complicated than ever before. They should be given every assistance in a difficult and important task. Let us devise for them a Strategic Map, as useful as the Hydrographic chart is to our navigators.





Official Department of Defense Photograph

DEFEATED GERMAN SOLDIERS MARCHING THROUGH BERLIN

Today the 65,000,000 Germans are split up and powerless, but the individual German remains a competent technician and fighting man.

RACIAL CHARACTERISTICS AND FIGHTING CAPACITY OF THE GERMAN

By CAPTAIN ROLAND E. KRAUSE, U.S.N.

FOR two thousand years the area known to us as Germany has been the pressure center of Europe, from which endless armies of men and women have moved to Scandinavia, England, France, Italy, Russia, the Americas, and other countries. Anthropological studies indicate a far wider diffusion of Teutonic blood than at first glance appears credible. Even in Spain we find the blonde, blue-eyed remnant of the Goth and Visigoth invasion. These Teutonic people were ever cosmopolitan, world-citizens, and readily made themselves at home wherever their emigrations took them. From the time of the first contact of the Romans with the Cimbri and Teutons in the second century B.C. until the present day, the population of Germany has always been relatively dense, for it was, and is, a strong vital race sustained in an energy-building climate. The keenness of their struggle through the years has maintained a healthy race.

Recurrent pressures from without have also had their effect. Germany has been the battle ground of Europe and the resulting invasions have left their mark. Thus in the east we find a German with a strong admixture of Slavic blood, while in the south he has been mixed with Alpine and Mediterranean blood. The race has changed; the German has taken on other attributes, yet much of the original remains, not so much perhaps in percentage as in the dominance of the Teutonic strain. These people still have much in common with the dreaming, drinking, singing, impulsive Germans described by Tacitus, but new blood infusions and the molding influence of civilization have produced the modern progeny.

The Germans have always lacked unity. Their history is replete with internecine strife and war—of province allied against province. Real political union dates from 1870 when the provinces fought shoulder to shoulder against France. Inner union had,

however, not been achieved, for the Germans remained provincial in thought and sentiment. This was in evidence even during World War I; moreover, the people were split into many political parties. The disastrous effect of that war with the unilateral dictates of the Treaty of Versailles and the continued oppression on the part of the victors served to weld these people into one, and union to the nth degree became a vital tenet of Hitler's dogma. "Ein Reich; ein Volk; ein Fuehrer" (One state; one people; one leader) became the watchword.

The boundaries between the provinces disappeared in theory at least, and Germany stood united as never before. Union makes strength, and this went to their heads. They felt they had the strength and, given the will, they could do anything. A decree is signed and boundaries fall away; a proclamation is made and political parties are dissolved. The tendency was that whatever the Nazis wished they could make it so by proclamation. The thoughts, the hearts, the souls of men may perhaps be guided but never commanded.

While Hitler achieved strong political union, sharp inner divisions not only continued to exist but actually grew. Some dissenters were eliminated, more were thrown into concentration camps, but still the problem continued to plague them. Although Hitler had a very strong following and commanded a nationalist sentiment of close to

CAPTAIN KRAUSE, as Assistant U. S. Naval Attaché at Berlin, 1938-40, had ample opportunity to study the Germans at first hand. During World War II he served in the campaigns of Morocco, Sicily, Salerno, Guam, Leyte, Lingayen, and Iwo Jima. Subsequently on duty in the Office of Naval Intelligence, he is currently with the Munitions Board, Chicago Orchard Airport, Park Ridge, Illinois.

100%, the Nazi party and its practices caused sharp inner cleavages. This had a deleterious effect on the German war effort. It was not so apparent when German arms were going from success to success, but when the going got tough it was most difficult for those of divergent ideologies to march shoulder to shoulder with each other. There was bickering and friction all down the line. Even the top Nazis, as revealed in the course of the Nuremberg trials, broke up in violent dissension.

The German is highly impressionable and sensitive to new ideas in extraordinary degree. He swallows an idea uncritically; he is completely dominated by it; and then he may just as readily discard it. It indicates a psychological instability. He is inclined to go to extremes and frequently seems a bit unbalanced. The urge to union during the Nazi regime is an illustration of this. His attitude on propaganda is an even better one. Hardly had World War I broken out when the enemy unleashed a flood of propaganda against the Germans, but the latter scarcely deigned to answer. In post-war years, they realized their mistake and came to appreciate the efficacy of this weapon. So they said, "We must make propaganda," and they went hard at it—unskillfully, even crudely.

The German is a character of extreme complexity, full of contradictions—a mixture of qualities which may combat and neutralize each other. Despite an open and frank disposition, he is inclined to be self-conscious and touchy; his vanity, unlike that of the Englishman which is sure and steady, is flighty. One finds it difficult to know just how to take him; thus he has become the despair of many a diplomat, and is so today. He is positive, direct-acting, and tenacious to the degree of stubbornness. Compromise is foreign to his nature, and if he is to be induced to compromise, this should be worked out for him. The third *Lusitania* note from the United States to Germany in 1915 paved the way for a compromise in the waging of the submarine war on commerce, but, if the Germans realized it, they did nothing to exploit it. He is dogged in high degree, and his patience reaches down to the very roots of his being.

On the surface he is apt to appear rough

and crude, but essentially he is soft-hearted, good-natured, sentimental, and idealistic. It would appear therefore that his martial character is not inherent but thrust upon him by outside circumstances. Centuries of warfare, invasions, enemies round about, have given him this plus a great military ability.

Like all Nordics, the German has the habit of introspection, the tendency to self-analysis, a willingness to face facts no matter how disagreeable. His nervous and mental energies turn him to reflection and deliberation before action. Nordic self-assertion is not lacking in him, for he has will-power, initiative, enterprise and acquisitiveness; yet his docility to autocratic control is notable. He looks humbly to all those above his station.

A cartoon of long ago typifies the German as "Sleepy Michael"—a man arousing himself but still half-asleep. There is still much of truth in this picture, for the German naturally lapses within himself so that an outer impulse is necessary to arouse him. This does not mean that he is lazy and falls to sleep at his work; on the contrary he is industrious and lapses into singleminded concentration thereon, wherein he becomes unaware of influences or events around him. On the street one may even see how the German comes out of his inner self when a band strikes up.

The American probably exceeds the German in toughness of moral and physical fiber, but the latter is less highly strung, more phlegmatic, and therefore his endurance is greater. The German can stand longer, sit longer, eat longer, drink longer, and dream longer than any other people except the Orientals. He could perhaps also play longer than others, but his mood runs to work rather than play. He has drugged himself with work, and has found it his refuge in trying times.

The German does not naturally go in for sports and this may explain his lack of physical alertness, vivacity, and audacity, compared to other men. This lack has been partially counteracted by rigorous training in the armed forces. Subsequent to World War I when Germany was demilitarized, sports were promoted to aid physical development.



Official Department of Defense Photograph

RETURN TO THE WAYS OF PEACE

These Berlin farmers, harrowing their field in the shadow of a German gun emplacement, represent the industrious man of the German people.

Like all branches of the Germanic tree, the German is gifted with the invaluable quality of individual initiative, which has perhaps done more than any other to give world dominance to this blood strain. Other racial stocks possess this attribute only in limited degree, for theirs is a tendency to herd instinct. However, the German has lost much of his individualism as a necessary surrender for organization and unity, and in a sense has become a cog in the state and industrial machine. Obedience has been instilled in him to such a high degree and to a far greater extent than the American that the German will obey the letter rather than the spirit of an order. Yet, experience in both World Wars shows that individual initiative is not a dead trait in the German character; moreover there are some inspiring examples of it, as for instance, General Francois' move at the Battle of Tannenberg in 1914 which turned a German victory into a Russian rout, and General Rommel's campaign in North Africa during the recent war.

The German stands in the forefront of

scholars. He is surpassed by no other in his grasp of the sciences insofar as they concern the inanimate side of life; his achievements in archaeology, chemistry, and physics are conspicuous. He reasons well, but his power of imagination is great and the two frequently conflict. He is likely to pursue ideas tenaciously into the realm of phantasy and contrary to any possibilities. Grand Admiral Doenitz and others in authority had an *idée fixe* that the German submarine war on commerce would produce decisive effect in World War II, when cold and sober calculation should have indicated that the Allies were on the way to overcoming the menace in 1942 and that with the submarine reverses of the spring of 1943 decisive success could no longer be hoped for.

Germany occupies a median position as a producer of inventors and men of genius; her forte is rather the development, or improvement, of the known. An American invented the submarine but the Germans developed it to its highest point in World War I. Even though German development was ar-

rested by her defeat in that war, they entered World War II with a small but very effective submarine arm. It distinguished itself with most important developments during the recent war, such as "snorkel" and a radically new drive to give the U-boat a high submerged speed.

Where, however, the German seeks to lead, govern or win other people, he shows a marked deficiency, for here he is face to face with men. His history in colonization and in adoption of foreign elements into the German family furnishes a series of examples which prove the issue, such as his miserable failure in Southwest Africa where he aroused the enmity of the Hottentots and the Hereros, and the disappointing amalgamation of the people of Alsace-Lorraine following the war of 1870. He has persistently failed to win the allegiance, the loyalty, and the respectful regard of other people at home and abroad who came under his dominion. The Germans realized this weakness on their part and in World War II endeavored to profit by past lessons in governing Norway, Denmark, France, Holland, and other countries, but again they failed. It is just as impossible to make a silk purse out of a sow's ear as it is to change fundamental racial characteristics.

The Prussian, in whom Nordic blood predominates, is the aggressive element amongst the German people. This is said advisedly even though the leader of Nazi Germany was an Austrian and certain South-Germans were notable pillars of support. Whether for good or ill, the Prussian has been the driving power. Perhaps most of the human relations friction is attributable to him rather than the amiable South-German. The former took to heart the advice of Prince Buelow, "If you cannot be loved, then you must be feared." Where the wise man uses oil in his relations with his fellowmen, the Prussian uses sandpaper. In fact, tactlessness is a national trait of the German; Ribbentrop, the German Ambassador in London, giving the Nazi salute to the King of England, is one of the highlights of our time. The German tends to develop an exaggerated estimate of his own power and at the same time underestimates that of other peoples. Moreover there is a persistent incapacity of the German to

understand another man's point of view.

One is struck by the small amount of hate that the German engendered for his enemies in recent times and by the philosophical way in which he accepts defeat. The conditions of war are ingrained in his nature—someone wins and someone must lose—it is all part of the game. If one does not fight fair, and the Germans considered that the British propaganda campaign of World War I was not fair, then he will begin to hate. Thus, "perfidious Albion" came in for a share of it, while France, although Germany's hereditary enemy, was respected as fighting a good fight. However, the German cannot hold a grudge for long; he tends to forget in a short while and will then make up. The post-World War I shift of German policy from enmity to conciliation with Great Britain would have been much more difficult were this not so.

The German shows a persistent tendency to seek personal leadership but competent leaders, particularly in diplomacy, have been lacking. In recent decades Bismarck is the only star in the firmament of their statesmanship. For a time it appeared that Hitler might be another, but his mistakes were so appalling that his earlier successes faded into insignificance. His policy led to ruin and no greater indictment can be made of a statesman.

Here then is Germany's vital weakness; she can breed a competent people but cannot raise a few far above the general average. Napoleon's precept, "It is the man who is wanted, and not men," is particularly apt in this connection. The German mind and character tend toward narrowness through concentration on one line of endeavor, but fail to achieve broad knowledge and vision. Moreover the leader must be a master of men and the German's aim has been to master the inanimate side of life. It is a race of technically educated men, and it is said that nine-tenths of such men work for those liberally educated. This is why the Jews were able to garner such a disproportionate share of German wealth between the two World Wars and this in turn contributed to the national resentment which we have witnessed in recent times. The British nobility has supplied competent leadership to its country

but the German nobility, through pride of caste and birth, failed to avail itself of the quickening influence of new blood and generally produced men of sterile minds. Suppose the British had supplied Germany with just a few statesmen—what a power they might have been!

The acid test of fighting capacity is, of course, the conduct of war. In two World Wars the German armed forces showed superior ability, high morale, technical intelligence, and staying-power. They produced able organizers, excellent tacticians, and competent-to-outstanding military strategists. They were weak in the coordination of strategy on the top level and fatally deficient in the realm of policy.

Hitler's last-ditch fight has left Germany in ruins. During the last war she lost several millions of men and women—casualties not only at the front but in the many cities laid waste. Her production facilities which survived the bombing are being dismantled, destroyed, or shipped away for reparations, leaving only small industry. The country has been partitioned and occupied. She will not be able to precipitate another World War

within the foreseeable future.

Yet, we must not lose sight of the fact that there are over 65,000,000 ethnic Germans within central Europe. As a group they are split up and powerless, but as an individual the German remains just as competent a technician and fighting man. We may expect that they will go along with those who can and will help them on their feet economically and politically to rebuild their country. The urge to union is by no means dead; it will in fact be promoted by current conditions of adversity.

We are wont these days to speak of the atom bomb as the acme of modern power but here in the form of 65 million Germans we have an atom bomb of incomparable effect. How this force will exert itself remains to be seen. We know that the statesmen representing the great democratic and communist ideologies are not unmindful thereof. We know too that the German by nature will incline toward democracy and has so declared himself in the world today. Yet it will require our best effort and wise statesmanship to secure for the forces of democracy this potent weapon for peace or war.



MISTAKEN IDENTITY

Contributed by LIEUTENANT FRANK C. HEROLD, *U. S. Coast Guard (Retired)*

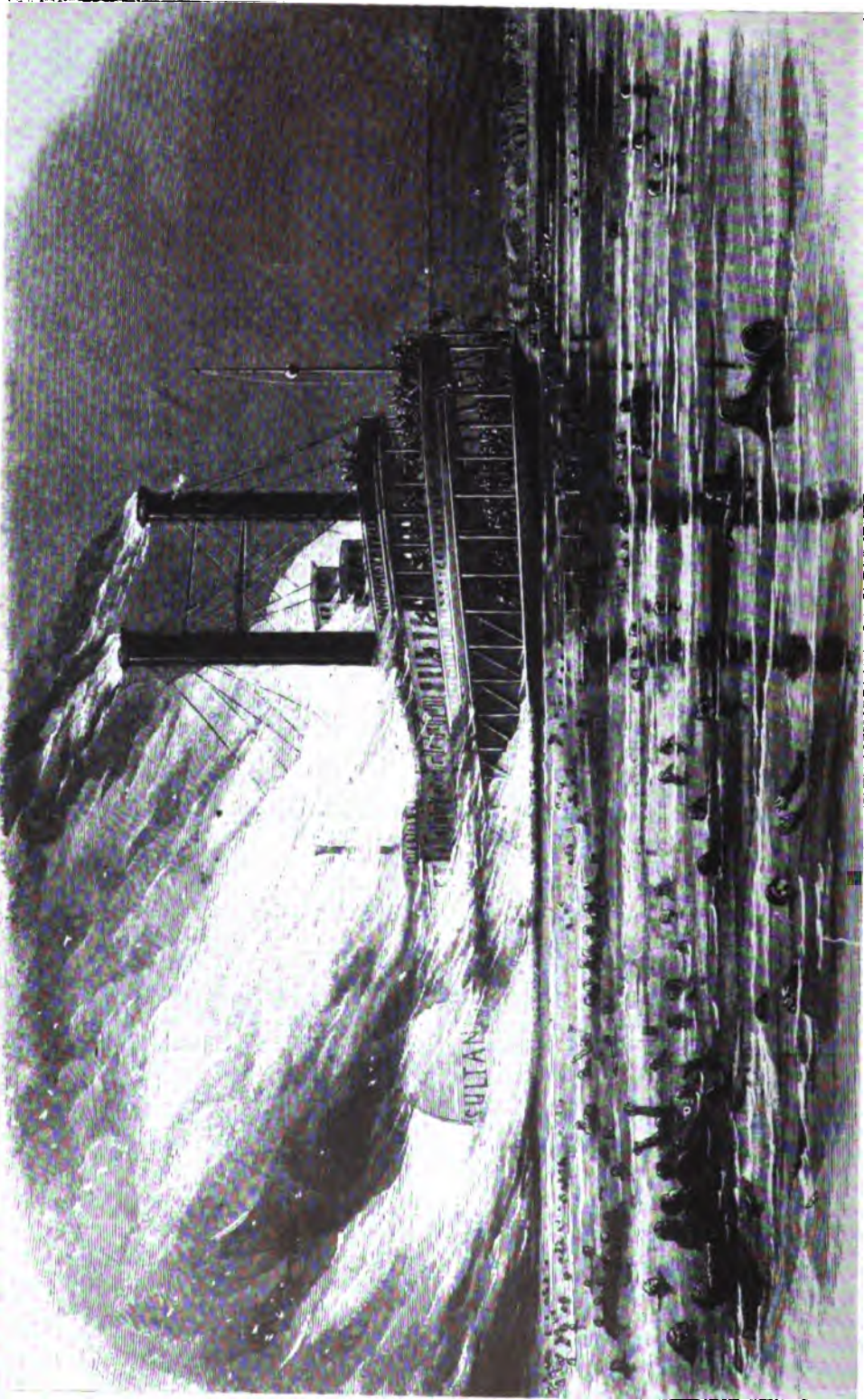
In the early 1930's I was skipper of an off-shore patrol boat operating in the Gulf of Mexico. Like most small vessels we had a "character" in the crew; that is, one of those individuals who was always good for a laugh. He took and gave a lot of ribbing. Reasons to rib him were abundant because "Tex," our ship's cook, was a genius one minute and a moron the next.

He was active in everything. If there was devilment aboard, Tex was probably the instigator. If it was a church party, he was probably the leader. When there was time for baseball in port, Tex was the pitcher—and a good one. He had a very fast ball and earned the reputation among the crew of having a "million dollar arm and a ten cent head!" We never knew what to expect, except that it would be original.

One day at sea a machinist's mate named Galloway made a very sudden bee-line for the galley, seeking shelter from a bee that was after him. Where it came from no one knew. But it managed to stay about two inches behind Galloway's ear, buzzing in all its fury. About five seconds later Tex came flying out of the galley hatch, said bee now after *him* and buzzing uncomfortably close to the back of *his* neck. Tex was waving his arms frantically, and by way of explanation to a few of us who were looking on he seriously exclaimed:

"This blankety-blank bee thinks I'm Galloway!"

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to and printed in, the PROCEEDINGS.)



EXPLOSION OF THE *SULTANA*, APRIL 28, 1865

Small and obscure as she was, the *Sultana* claimed the lives of 1,450 men when, loaded with Civil War veterans, she blew up on the Mississippi, seven miles above Memphis.

Courtesy of the Beltramm Archive

THE WORST MARINE DISASTER IN U. S. HISTORY

LIEUTENANT COMMANDER RALPH P. DILLON, *U. S. Naval Reserve*

Pick up the noun, "sultana," in your favorite dictionary or encyclopedia.

Depending upon the size of the reference work, you will find that it means (a) the daughter of a Sultan; (b) an odd sort of grape found in Australasia; and (c) a type of wine grape. What you will *not* find is that *Sultana* was also the name of a Mississippi steamboat, a name that deserves a place in maritime history beside that of the *Titanic*. Because of a trick of fate, the story of *Sultana* is virtually unknown—yet the loss of the *Sultana* as the result of a military order cost the lives of more than any other single catastrophe in the history of America.

Compared to the *Titanic*, the *Sultana* was tiny, hardly to a battleship. She was certified to carry only 376 passengers, a frail wooden steamer with tall twin stacks on either side of her pilot house—a typical river steamboat.

When the great White Star liner, *Titanic*, sank after ramming an iceberg in the waters of the north Atlantic on her maiden voyage in 1912, she carried 1,517 men and women to their deaths, and more than \$12,000,000 in cargo went to the bottom. The *Sultana*, small and obscure as she was, claimed the lives of 1,450 men when she blew up! Catastrophe overtook her in April 1865, and even today, after two World Wars, her death-toll is surpassed only by that of the *Titanic*, a British ship, and two other marine disasters in China.

She had just captured Vicksburg, after a long and terrible siege, when the *Sultana* was sunk in 1863. She was launched at Cincinnati, and her owners were James C. Mackay, W. A. Thornburgh and Dameron C. Mackay, all of St. Louis. Since steamboats were badly needed in those dark days of the Civil War, the *Sultana* was pressed into military service by the Federal authorities before her paint was dry. Mason, who

had a three-eighths interest in her, was her master.

During her short life, the *Sultana* saw hard service. Hers were no peaceful journeys up and down the Ohio, the Missouri, and the Mississippi. Not for her were the thrilling races against rival steamboats, or romantic moonlight nights with Negro roustabouts singing on the levee. Hers were races against time, churning down stream and back under forced draught, to hurry supplies and troops where they were needed. There was never time for overhaul or for any substantial repairs.

The *Sultana* lay at New Orleans, loading sugar, on April 21, 1865. Mason, her master, must have sighed with weary relief when he saw the last sack on board and gave the order to get under way for Vicksburg. The Civil War was over—Richmond had capitulated, Grant had met Lee at Appomattox Court House on April 9. In the Capitol at Washington, a nation mourned—Abraham Lincoln had been dead less than a week. But the war was not over for the *Sultana*. Ahead of her was a long, hard journey up-river, and her condition was rapidly going from bad to worse. Her hull needed paint, her paddles were splintered by the river snags, and her boilers, weakened with scale and rust, were leaking at every seam.

When she put into Vicksburg three days later, repairs were imperative. Workmen were brought aboard to patch her flimsy boilers just enough to stand the pressure of

LIEUTENANT COMMANDER DILLON entered the Navy in May, 1941, and spent three years in destroyer escorts subsequent to duty with the District Intelligence Office, Twelfth Naval District. After the war he instructed in navigation for the Organized Reserve (Surface) at the Naval Activities at Treasure Island, San Francisco, California.

the northward trip, but Destiny had other plans in store for the *Sultana*.

In spite of the protests of Capt. Mason, the *Sultana* was ordered to embark on a large detachment of released prisoners of war, as well as two companies of infantry en route to Cairo, Illinois, to be mustered out. Accompanying them were 60 horses and mules. When she was finally ready to cast off, the *Sultana* was burdened with 2,200 men and 60 animals—her rated capacity, remember, was only 376.

On April 26, the *Sultana* limped into Memphis, leaking steam like a teakettle. The patching job at Vicksburg was just a make-shift, and the terrific strain of pushing upstream with six times her rated load was beginning to tell. Capt. Mason discharged as much of his cargo as possible on the Memphis dock, and went to make another protest to the Federal authorities. He might as well have saved his breath, for he was told, "Patch up your boilers as best you can, but sail you must!" The Union officer-in-charge was anxious to get the returning prisoners of war to a place where they could receive proper medical care, and Capt. Mason's vigorous objections were overruled.

Picture to yourself what conditions must have been aboard that poor little side-wheeler. Into every available space were jammed not only two full companies of able-bodied soldiers and 35 officers, but 1,969 sick, half-starved veterans who had dragged out months of war in the stinking confines of Andersonville, the most infamous of all Confederate prison camps. Clothed in tatters, fed on little more than garbage, forced to exist in crude shanties or dig themselves holes in the ground like animals, these pitiful creatures were desperately in need of clean air, good food, and above all, medical attention. Yet, crowded almost beyond endurance aboard the *Sultana*, they were, if one can believe reports, laughing and happy—they were going home!

So it was that the *Sultana* put out into the stream and headed north from Memphis on April 27, 1865. She lay low in the water and her paddlewheels groaned as they churned the muddy waters of the Mississippi.

Seven miles above Memphis the channel winds among a group of small islands and sand bars, known to pilots of the day as

Paddy's Hens and Chickens. Just as she came abreast of the first island, the *Sultana* was rocked by a terrific explosion—one of her four boilers had blown up. Shattered by the blast her decks erupted like a mad volcano. Quickly she lost headway as the flames shot up. The air was filled with screams of dying men. Those nearest the rails were crushed by the mass of clawing, fear-maddened victims behind. Those who could leaped into the river and were carried away, but only a few reached the shallows. Some, driven by panic, swam incredible distances only to go down in the boiling current.

Stronger men might have saved themselves, but what chance had those poor devils who were hardly able to stand, let alone swim. One brief newspaper account of the disaster relates how five hundred souls huddled in the bows of the vessel to escape the flames driven aft by the wind, but the stricken *Sultana* drifted with the current and the flames were reversed—all perished.

The pilot, Caton, escaped injury when the pilot house was blown clear and he fell into the river. He, and others, spread a rumor that the *Sultana* had been blown up by Confederate sympathizers, among her engineers. They were alleged to have concealed a torpedo in her coal and then escaped by small boat. One report even declared that they were captured and shot. However, official investigation disproved this tale. The engineers perished in the explosion, and it was proved that the *Sultana's* boilers were badly fouled with sediment, and that the repairs had been faulty. If anyone was shot, it was probably one of the ghouls who came to prowl among the dead in search of loot. The shattered hulk went aground on a sand bar and burned to the waterline.

No one knows for certain how many men perished that night. All survivors are gone now, and even the records of the former Bureau of Marine Inspection and Navigation have been reduced to a summary on file cards in the National Archives. This source sets the death toll at "more than 1,500"; another estimates it as 1,450. Because of the death of Abraham Lincoln, the details of his funeral cortege and the nation-wide search for his assassins, newspapers of the day relegated the tragedy of the *Sultana* to what would, today, be the stock-market page:

THE NAVY SEEKS BUSINESS EFFICIENCY AS WELL AS COMBAT EFFICIENCY

By COMMANDER LAMAR LEE, JR., SC, *U. S. Navy*

THINK of expanding a business enterprise 35 times overnight! That is what the Navy had to do in the last war. The most efficient business enterprise in the world could not expand at this rapid rate, without waste, even under ideal circumstances. The Navy was called upon to do it at a time of confusion and uncertainty, at a time when everything required for expansion was in short supply.

In addition to expanding at an unprecedented rate, the Navy was called upon to make monetary decisions that were related to lives as well as to economy. This fact, in addition to the rapid expansion and the normal complexities of military supply, created an extremely complicated material control problem. Yet, despite all of the ramifications of this problem, the Navy did develop controls and programs designed to make maximum use of every appropriated dollar. All of these programs are interesting, but this article will be confined to just one of them: a very interesting one—the Navy's Inventory Control Program.

The program was started in 1944, by then Secretary of the Navy Forrestal, with the objective that the supply of, and the demand for, each item of Navy material be balanced—in other words, with the objective that the Navy determine and then buy exactly what it needs. Overbuying and underbuying are equally serious and dangerous. The first results in wasted production, wasted manpower, and wasted transportation; the second results in delays to schedules and costly emergency procurement. Serious mistakes in either direction could in time of war cost victory itself. The need for inventory control, the means of determining how much of each item should be procured and stocked, is, therefore, a matter of extreme and immediate importance.

Because the General Motors Corporation, Montgomery Ward and Company, and other

leading business enterprises have spent millions of dollars yearly for many years to attain inventory control, one might properly ask, why did the Navy delay until 1944 to start its inventory control program? In answering this question it must be remembered that before the last war the Navy had no need for such a program. Only 250,000 items were carried in stock; these items, called General Stores, were for the most part common types of supplies that were utilized by nearly all ships and stations. A large percentage of these items was cataloged and centrally controlled by the Bureau of Supplies and Accounts, Navy Department, Washington, D. C.

With the advent of World War II and its impact on the nation's inventive and productive genius which in turn gave the Navy a multiplicity of new weapons and machines, the number of items stocked increased from approximately 250,000 to over 3,000,000. Because of the fact that in the early years of the war the demand for all items greatly exceeded the supply, the Navy fully realized that it was forced to buy some things in substitution for things really desired and that numerous supply and distribution systems were springing up within the Navy; however, there was nothing that could be done, at the time, to stop this most undesirable situation. For instance, the engineers in the Bureau of

COMMANDER LEE, since graduating from the Naval Academy in 1933, has served afloat in all types of major combatant vessels and ashore at two naval shipyards. During World War II, he served as Supply Officer in Command of the Naval Supply Depot, Guam. Shortly after the termination of the War he was assigned as Chief of the Inventory Control Office in the Office of the Assistant Secretary of the Navy (Material Division). Commander Lee at present is Supply Officer of the Philadelphia Naval Shipyard, with additional duty as Submarine Supply Officer.



Official U. S. Navy Photograph

NEPTUNES (P2V's) OF PHOTOGRAPHIC SQUADRON ONE OVER ALASKA

BuAer has found that great savings can be made by eliminating stocking of identical but differently numbered parts and bits for aircraft maintenance.

Ships realized only too well the desirability of having the same types of electrical equipment on all new aircraft carriers. This ideal situation would have permitted a relatively small stock of repair parts, would have permitted a simple distribution system, and would have allowed emergency transfers of repair parts between the ships at sea.

No single manufacturer or group of manufacturers, however, had in stock enough of the type of electrical equipment desired for all of the aircraft carriers being built; nor could they manufacture the amounts required without re-tooling. The choice, therefore, had to be made between taking the different types of electrical equipment which were available or delaying the construction of the carriers to allow manufacturers time to re-tool. This problem of getting what is desired (specifications) or taking something that will do the job (performance) always has complicated and always will complicate the material problem in time of war.

After a war once starts, the emphasis is rightly placed on production; there just

isn't time to permit re-tooling of industry. The engineers have to be content with any piece of equipment that will allow ships to operate. When a nation is fighting for its very life, it is far better to have two aircraft carriers with different types of electrical equipment, different types of pumps, boilers, turbines, etc., than to have only one carrier, regardless of the immediate monetary loss and the continuous waste which results in not getting the equipment that is really wanted. Only as new plants are built or old plants expanded, is opportunity provided to tool these plants in a manner which will achieve material specifications rather than performance specifications.

It was because of these facts that the Navy was not able to pursue a unified Navy-wide Inventory Control Program until 1944. Previous to that time progress was confined to specific categories of material. Initial success, by utilizing all of the modern principles of inventory control, was attained in the field of aviation supply. The Aviation Supply Office was the Navy's first effective in-

ventory control point. This point, as the result of the application of inventory control principles to airplane engine parts alone, saved the Government, in the year of 1944, more than \$275,000,000; more than enough to operate the Aviation Supply Office at full wartime strength for over 30 years.

It was apparent in the earliest phases of the program that inventory control was a joint problem, one that could be solved only by the joint cooperation and avowed willingness of each technical bureau (engineering specialists) and the Bureau of Supplies and Accounts (supply specialists). Realization of this fact has permitted the program to operate with dispatch and efficiency.

Inventory control in the Navy is attained by the accomplishment of two primary objectives:

- (1) Navy-wide determination of requirements by central stock control points.
- (2) Establishment of a catalog of Navy material—the medium which provides common language between all procuring and stocking activities.

A good start has been made toward the accomplishment of these objectives. Control points have been established for all categories of materials. The cataloging program is progressing very satisfactorily; however, because of the large number of items to be catalogued, this program cannot be completed for an estimated 3 to 5 years.

If one has any doubt concerning the effectiveness of the Navy's formula for attaining inventory control, let him examine the economies and savings, presently resulting from cataloging operations, represented by the typical examples cited below. Some of the facts presented are in terms of consolidation and reduction of inventories. For these facts no exact monetary savings have been developed because the figures would be controversial; however, no one can deny that the monetary savings are substantial.

Bureau of Aeronautics

The Bureau of Aeronautics has determined that thread taps from three different suppliers costing \$9.12, \$2.33, and \$0.73 each



Official U. S. Navy Photograph

THE U.S.S. ROANOKE (CL-145) AT SAN JUAN, SEPTEMBER, 1949

BuShips has found that its Ships Parts Control Center can save \$25,000,000 on an inventory of \$282,000,000 in six years' time.

are identical. The Bureau has also discovered that maintenance packing items supplied by different manufacturers at \$8.28 and \$2.34 each are identical; similarly that repair part screws purchased for \$2.88 per gross and \$1.21 per gross are identical. Knowledge of this information has resulted in considerable savings.

By determining the actual manufacturers of repair parts, the Bureau has found that by procuring direct from prime manufacturers rather than from other sources of distribution, it can save \$1.05 on each poppet assembly purchased and \$15.41 on each caster purchased.

Bureau of Medicine and Surgery

The Bureau of Medicine and Surgery and the Office of the Surgeon General of the Army have combined their efforts to make a joint catalog. As a result, the Bureau of Medicine and Surgery discovered that at least 3,500 items of the approximate 4,000 items in its supply system were common to those of the Army Medical Supply System.

Thirty per cent of the combined items previously stocked by the two services were deleted through consolidation of common items. In addition to the substantial savings that are being realized by reduction in the number of items stocked, the Bureau also anticipates a saving of \$77,900 as a result of combining the production of its catalog with that of the Army.

Bureau of Ordnance

This Bureau has reduced the number of items in its supply system through the discovery of identicalness as follows:

		<i>Estimated Annual Savings Procurement Only</i>
Ball Bearings	88%	\$750,000
Oil Seals	80%	115,000
Cotter Pins	82%	30,000
Taper Pins	70%	140,000
Screws	84%	306,000

Bureau of Ships

Of some 50,000,000 numbers by which this Bureau's items of supply have been known, 4,000,000 numbers have been researched with the result that only 510,000 numbers

were found to apply to items which can be considered as replaceable parts. Furthermore, research of these 510,000 numbers has revealed that there are only 20,000 actually different parts.

It was also determined that:

a. One manufacturer has supplied the Bureau of Ships with two screws as replacement parts, identified as Nos. 339 and 550, at a cost of 5 cents and 10 cents respectively. Research revealed that these screws are identical and are the same as one screw carried in General Stores at the price of 7.2 mills.

b. Ninety-four different numbers were assigned to a single refrigeration compressor piston.

c. One pinion shaft supplied by one company was known by 13 different identifying numbers.

d. One manufacturer of turbines supplied this Bureau with bearing liner assemblies at a cost of \$25.00 each. Another manufacturer supplied bearing liner assemblies at a cost of \$63.00. Research disclosed that both assemblies are identical and are manufactured by another firm which could supply them to the Navy at a cost of \$9.06 each.

The Ships Parts Control Center, the inventory control point for ship's hull and machinery parts, estimates that it will effect in a period of six years, by means of its cataloging program, a net saving of \$25,000,000 on an inventory of \$282,000,000.

Bureau of Supplies and Accounts

Although the Bureau of Supplies and Accounts catalogs only General Stores material, it has a greater interest in cataloging than any other Bureau. The reason for this fact is that the majority of Supply Demand Control Points, where most cataloging operations are performed, are under the management control of the Bureau of Supplies and Accounts.

This Bureau also has the major responsibility in the consolidation and development of cataloging within the Naval Establishment and is now actively engaged in two major projects: Anti-Friction Bearings and Electronic/Electrical Equipment. In the former project, this Bureau has found that approximately 300,000 bearings identification numbers, submitted by other Bureaus

and researched by its own staff, represented less than 9,000 actually different items. In the Electronic/Electrical Equipment Project, 150,000 reference numbers used for identification of electronic equipment were found to represent only 29,000 truly different items.

Bureau of Yards and Docks

As a result of preliminary cataloging operations, this Bureau reduced the number of items of common construction material and equipment by 25 per cent. This reduction was accomplished by the elimination of items found common to other Bureaus and subject, therefore, to inclusion in the Bureau of Supplies and Accounts controlled material.

Marine Corps

The Marine Corps recently made obsolete one type of radio set in favor of a new design. Fifty-five of these sets having a total value of \$169,180 were in stock. Through proper identification of removable parts and disclosure of their uses, it was found that \$150,000 of new procurement could be prevented.

The Navy's business efficiency is increasing daily. And so is cooperation between the Army and Navy. This cooperation has always been much more extensive than most people have realized. There have been many joint efforts like the joint Army-Navy

Medical Cataloging Program previously described. In the last war, for example, the Army purchased the food, lumber, and small arms used by the Navy. The Navy took care of all of the Army's petroleum requirements in the Pacific, etc.

Since passage of the unification act—the National Security Act of 1947—cooperation and unity of purpose between the services has gone forward to even higher ground. The Munitions Board has already developed plans for a cataloging program which will ultimately allow exchange of supply data among the three armed services. This program will not only facilitate exchange of information and redistribution of materials but it will also provide the means for determining such things as the proper allocation of materials, facilities, manufacturing plants, and procurement assignments among and between the armed services.

From these facts one can see that the Navy is actively striving to be as efficient in its business operations as it is in its combat operations. The naval authorities realize only too well how closely related are these two subjects, how one is dependent on the other. Dollars saved on business operations can be used for training personnel, for buying improved weapons, for operating more vessels and aircraft. For this reason, one can be absolutely sure that the Navy will not waste one cent knowingly and without cause—cause that in some cases perforce must take precedence over economy.



WEATHERWISE AND OTHERWISE

Contributed by REAR ADMIRAL WILLIAM J. WHEELER,
U. S. Coast Guard (Retired)

Aboard a flagship on a cruise in the Old Navy it was the duty of the Midshipman of the Quarterdeck to make hourly visits to the entrance to the Flag Officer's cabin to secure the reading of an old-fashioned barometer there installed. The cabin door was open and the Commodore's decanter on the sideboard was temptingly near. The young man sampled its contents, unaware of the fact that the Commodore was strolling past the skylight overhead.

When the reading was being recorded, the Commodore inquired: "How is the barometer?"

"Steadily rising, sir," replied the midshipman.

"And how is the decanter?" further inquired the Commodore.

"Steadily falling, sir," promptly replied the midshipman.

There was a moment's silence. Then the Commodore's stern lips began to twitch. "Young man, your reply relieves you of the punishment that I would otherwise inflict."

(The PROCEEDINGS will pay \$5.00 for each anecdote submitted to, and printed in, the PROCEEDINGS).



Official U. S. Navy Photograph

FINDING THE INDEX CORRECTION OF THE SEXTANT

The new 1950 nautical almanac is going to save navigators a lot of time and figuring.

THE NEW TYPE 1950 NAUTICAL ALMANAC

By COMMANDER EDWIN A. BEITO, U. S. Naval Reserve

AT THE instant of midnight of New Year's Eve on the Greenwich meridian, or when the mean sun is at the 180th meridian, American navigators on the seven seas will commence using a new type *Nautical Almanac*. It is well for those concerned not to neglect gaining some acquaintance with the new almanac before it becomes necessary to use it. Navigators aboard ships along the western coast of South America and in the Indian Ocean will be among the first to use the new type almanac. Those on the west coast of South America will need it for evening sights December 31, 1949, and those in the Indian Ocean will use it for morning sights January 1, 1950. It is easily possible that both the present and the new type almanacs will have to be used for calculating a round of sights, some observations being made a short time before and some shortly after the instant of Greenwich midnight.

It is predicted that the new type almanac will be enthusiastically received by those who have found it necessary to thumb through numberless pages and make many mental and arithmetical interpolations to solve a round of sights with the present almanac. Under the arrangement in the new almanac the Greenwich hour angle and declination can always be found with two openings of the book. The altitude corrections have also been simplified. Interpolation is not required and parallax and semidiameter of the moon need not be found! The time necessary for working out sights will probably be cut in half. It may have some deflationary effect upon the ego of the navigator, who has always been regarded as somewhat of a savant aboard ship. With the advent of the new type almanac and the use of H.O. 211, H.O. 214, etc., for the solution of the astronomical triangle, the work of the navigator is simplified to such an extent that it can more easily be mastered.

The 1950 almanac represents a development of 100 years in almanac making. The

authority for the preparation and publication of the *American Ephemeris and Nautical Almanac* was granted by Congress in 1849, and first publication was for the year 1855. In 1858, when the need was seen for a more concise book for navigators, the parts of the *American Ephemeris and Nautical Almanac* which are required for navigation were reprinted in a separate volume as the *American Nautical Almanac*. In 1916 the almanac was completely revised and especially designed for the convenience of navigators. None of it was reprinted from the *American Ephemeris*. Supplements to the *Nautical Almanac* were issued in 1930 and 1931 giving the Greenwich hour angle of the moon, the first time this appeared in any almanac. In 1932 the Greenwich hour angle of the moon was incorporated in the regular almanac, and in 1934 the Greenwich hour angles of the sun, Venus, Mars, Jupiter, Saturn, and 55 stars were included. Since 1934 up to the present there has been no material change. The 1950 almanac is a complete revision prepared under the supervision of G. M. Clemence, Director of the Nautical Almanac Office of the United States Naval Observatory. The accuracy of the new almanac is at least equal to the present *Nautical Almanac*, and in some cases greater.

A sample of all types of tables found in the 1950 almanac is shown herewith, except the

A GRADUATE of St. Olaf College, Northfield, Minnesota, Commander Beito holds a Master's degree from the University of Minnesota and has studied at Columbia University, New York. He served in the Navy in both World Wars, and is now on active duty assigned to the Department of Seamanship and Navigation, U. S. Naval Academy. Between the wars he held positions as a surveyor, high school teacher, superintendent of public schools, and college professor. He is the author of *Alidade Surveying* and numerous pamphlets and magazine articles on scientific subjects.

DAILY PAGE

(1) 1950 JANUARY 1, 2, 3, (SUN., MON., TUE.)

GCT	VENUS - 4.4		MARS 0.8		JUPITER - 1.6		SATURN 1.1		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
h
0	100 04.5	140 50.4 -15 09.1	277 02.8 + 1 25.5	151 01.6 -19 13.2	288 59.4 + 6 01.7	41 37.3 112 +24 09.2 + 8						
1	115 06.9	155 52.1 08.4	292 04.4 25.2	166 03.5 13.0	304 01.9 01.7	56 07.5 112 24 17.2 + 7						
2	130 09.4	170 53.9 07.6	307 06.0 24.9	181 05.3 12.9	319 04.4 01.7	70 37.7 110 24 25.1 + 7						
3	145 11.9	185 55.6 06.9	322 07.6 24.6	196 07.2 12.7	334 06.9 01.7	85 07.7 109 24 32.9 + 7						
4	160 14.3	200 57.4 06.2	337 09.2 24.2	211 09.1 12.6	349 09.3 01.7	99 37.6 108 24 40.6 + 7						
5	175 16.8	215 59.1 05.4	352 10.8 23.9	226 11.0 12.5	4 11.8 01.7	114 07.4 108 24 48.1 + 7						
6	190 19.3	231 00.9 -15 04.7	7 12.4 + 1 23.6	241 12.9 -19 12.3	19 14.3 + 6 01.8	128 37.2 107 +24 55.6 + 7						
7	205 21.7	246 02.7 04.0	22 14.1 23.3	256 14.8 12.2	34 16.7 01.8	143 06.9 105 25 02.9 + 7						
8	220 24.2	261 04.4 03.3	37 15.7 23.0	271 16.7 12.0	49 19.2 01.8	157 36.4 105 25 10.1 + 7						
9	235 26.7	276 06.2 02.5	52 17.3 22.6	286 18.5 11.9	64 21.7 01.8	172 05.9 104 25 17.3 + 7						
10	250 29.1	291 08.0 01.8	67 18.9 22.3	301 20.4 11.8	79 24.1 01.8	186 35.3 103 25 24.3 + 6						
11	265 31.6	306 09.7 01.1	82 20.5 22.0	316 22.3 11.6	94 26.6 01.8	201 04.6 102 25 31.1 + 6						
12	280 34.1	321 11.5 -15 00.4	97 22.1 + 1 21.7	331 24.2 -19 11.5	109 29.1 + 6 01.8	215 33.8 101 +25 37.9 + 6						
↑ TO 24 ^h JAN. 1, JAN. 2, JAN. 3, ↓												
24	103 01.9	143 05.2 -14 17.9	278 59.6 + 1 02.8	153 17.2 -19 03.0	291 57.6 + 6 02.9	2 40.2 69 +28 06.5 - 7						
code	-	+ 19 + 7	+ 16 - 3	+ 19 + 1	+ 25 0							

(11) STARS

(5) FRONT COVER

CORRECTIONS TO OBSERVED ALTITUDES

No.	Name	Mag.	STARS AND PLANETS		SUN'S LOWER LIMB		HEIGHT OF EYE	
			Obs. Alt. corr'n	Obs. Alt. corr'n	Obs. Alt. corr'n	Obs. Alt. corr'n	Feet corr'n	Feet corr'n
1	Alpheratz	2.2	4 23 -10.9	9 44 -5.4	4 22 + 4.9	9 39 +10.4	1.0 - 1.0	46 - 65
2	Caph	2.4	4 26 -10.8	9 56 -5.3	4 25 + 5.0	9 51 +10.5	1.2 - 1.1	47 - 66
3	Deneb Kaitos	2.2	4 29 -10.7	10 08 -5.2	4 28 + 5.1	10 03 +10.6	1.4 - 1.2	49 - 67
4	Ruchbah	2.8	4 32 -10.6	10 20 -5.1	4 31 + 5.2	10 15 +10.7	1.7 - 1.3	50 - 68
5	Achernar	0.6	4 36 -10.5	10 33 -5.0	4 34 + 5.3	10 27 +10.8	2.0 - 1.4	52 - 69
			4 39 -10.4	57 - 11.7 0.6	4 37 + 5.4	10 40 +10.9	2.3 - 1.5	53 - 70
6	Polaris	2.1	4 42 -10.3		4 41 + 5.5	10 54 +11.0	2.6 - 1.6	55 - 71

(6)

BACK COVER

CORRECTION TO OBSERVED ALTITUDE OF MOON

Obs. Alt.	0'	8'	15'	23'	30'	38'	45'	53'	60'	Obs. Alt.	0'	8'	15'	23'	30'	38'	45'	53'	60'
1	32.6	33.6	34.5	35.3	36.1	36.9	37.6	38.2		46	38.6	38.5	38.5	38.4	38.3	38.2	38.1	38.0	
2	38.8	39.4	40.0	40.5	41.0	41.4	41.9	42.3		47	37.9	37.8	37.8	37.7	37.6	37.5	37.4	37.3	
3	42.7	43.1	43.4	43.8	44.1	44.4	44.7	45.0		48	37.2	37.1	37.1	37.0	36.9	36.8	36.7	36.6	
4	45.2	45.5	45.8	46.0	46.2	46.4	46.6	46.8		49	36.5	36.4	36.3	36.2	36.2	36.1	36.0	35.9	
5	47.0	47.2	47.4	47.6	47.7	47.9	48.0	48.2		50	35.8	35.7	35.6	35.5	35.4	35.3	35.2	35.1	

Sun's Upper Limb Correction table, *Polaris* tables, and *Conversion of Arc to Time* table. The almanac contains 288 pages. In the front section of the book two facing pages, referred to as *left-hand* and *right-hand* pages, give complete data for three days. Table (1) is found on the *left-hand* pages and tables (2), (3), (4), (7), (8), (9), and (10) are printed on the *right-hand* pages. In the second section, the *yellow tables* (12), so named because they are printed on yellow paper, contain 60 tables, one for each minute of the hour. One part (consisting of the first four columns) has 60 lines, one for every second of the minute,

and is used to bring the hourly value of the Greenwich hour angle (GHA) up to the minute and second of observation. The other part (making up the last three columns), with 180 values, is for use in bringing the hourly value of the declination up to the minute of observation, and also for obtaining small corrections to the GHA of the planets and the moon. *Altitude Correction* table for the moon (6) is found on the back cover and other altitude correction tables (5) are printed on the front cover. *Additional Altitude corrections* table (4) for the sun, moon, Venus and Mars are found on the *right-hand*

DAILY PAGE

(2)

1950 JANUARY 1, 2, 3, (SUN., MON., TUE.)

(4)

GCT	SUN		(3) STARS				Lat.	Sunrise	Twil. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS			
	GHA	Dec.	No.	SHA	Dec.	Transit Mer. Gr.				1	2	3	4	Alt.	Sun's Lower Limb	Venus	Mars
0	179 11.3	-23 04.2	1	358 33.2	+28 49.0	17 19	70	6 45		(7)	(8)						
1	194 11.0	04.1	2	358 22.9	+58 52.7	17 19	68	6 38									
2	209 10.7	03.9	3	349 43.8	-18 15.8	17 54	66	6 33									
3	224 10.4	03.7	4	339 22.3	+59 58.9	18 35	64	6 27	10 29								
4	239 10.1	03.5	5	336 01.9	-57 29.7	18 49	62	6 22	11 22	11 12							
5	254 09.8	03.3					60	6 18	11 55	12 10	12 51	14 10					
6	269 09.5	-23 03.1	6	332 50.0	+89 02.1	19 01	58	6 14	12 19	12 43	13 29	14 42					
7	284 09.2	02.9	7	328 54.7	+23 13.8	19 17	56	6 10	12 38	13 08	13 56	15 06					
8	299 08.9	02.7	8	315 54.2	-40 30.4	20 09	54	6 07	12 55	13 27	14 17	15 25					
9	314 08.6	02.5	9	309 48.7	+49 41.4	20 33	52	6 03	13 09	13 44	14 35	15 42					
10	329 08.3	02.3	10	291 44.0	+16 24.8	21 45	50	6 00	13 21	13 58	14 50	15 56					
11	344 08.0	02.1					48	5 53	13 46	14 28	15 20	16 24					
12	359 07.7	-23 01.9	11	281 57.7	-8 15.4	22 24	45										
↑ JAN. 2 DATA FOR SUNRISE ETC ↓ JAN. 3 57 STARS 70 N TO 60 S																	
18	88 52.0	-22 49.9	Equation of Time (App.—Mean)				GCT of Transit Meridian of Greenwich										
19	103 51.7	49.6															
20	118 51.4	49.4															
21	133 51.1	49.1															
22	148 50.8	48.9															
23	163 50.6	48.6															
24	178 50.3	-22 48.4															
code	-	+ 2															

(12)

44^m

YELLOW PAGE

45^m

SUN PLANET	T	MOON	code		code		code		SUN PLANET	T	MOON	code		code		code	
			code	corr'n	code	corr'n	code	corr'n				code	corr'n	code	corr'n	code	corr'n
0	11 00.0	11 01.8	10	29.9	0	0.0	60	4.5	120	8.9	0	11 15.0	11 16.8	10	44.3	0	0.0
1	11 00.3	11 02.1	10	30.2	1	0.1	61	4.5	121	9.0	1	11 15.3	11 17.1	10	44.5	1	0.1
2	11 00.5	11 02.3	10	30.4	2	0.1	62	4.6	122	9.0	2	11 15.5	11 17.3	10	44.7	2	0.2
3	11 00.8	11 02.6	10	30.6	3	0.2	63	4.7	123	9.1	3	11 15.8	11 17.6	10	45.0	3	0.2
4	11 01.0	11 02.8	10	30.9	4	0.3	64	4.7	124	9.2	4	11 16.0	11 17.9	10	45.2	4	0.3
15	11 03.8	11 05.6	10	33.5	15	1.1	75	5.6	135	10.0	15	11 18.8	11 20.6	10	47.8	15	1.1
16	11 04.0	11 05.8	10	33.8	16	1.2	76	5.6	136	10.1	16	11 19.0	11 20.9	10	48.1	16	1.2
17	11 04.3	11 06.1	10	34.0	17	1.3	77	5.7	137	10.2	17	11 19.3	11 21.1	10	48.3	17	1.3
18	11 04.5	11 06.3	10	34.2	18	1.3	78	5.8	138	10.2	18	11 19.5	11 21.4	10	48.5	18	1.4
19	11 04.8	11 06.6	10	34.5	19	1.4	79	5.9	139	10.3	19	11 19.8	11 21.6	10	48.8	19	1.4
75	5.7	135	10.2						75	5.7	135	10.2					
76	5.8	136	10.3						76	5.8	136	10.3					
77	5.8	137	10.4						77	5.8	137	10.4					
78	5.9	138	10.4						78	5.9	138	10.4					
79	6.0	139	10.5						79	6.0	139	10.5					

daily pages. A list of 57 stars (11) numbered in order of their right ascensions is printed on the front cover.

Correcting Sextant Altitudes (hs) to Obtain Corrected Altitudes (Ho). (Marine Sextant).

The Nautical Almanac tables for correcting sextant altitudes (hs) are critical-type tables, the limiting entering arguments for each correction being given, and no interpolation is necessary.

Stars and Planets (5). This table corrects for refraction (R) only. It does not exactly agree with Table A of the present almanac because calculations are more exact.

Sun's Lower Limb. (5). This table corrects for refraction (R), parallax (P) and the smallest annual semidiameter (SD), 15.7'. *Additional Corrections* table (4) corrects for increased SD for date. Combined, these tables give the same corrections as Table A and B in the present Almanac.

Height of Eye (5). This table corrects for dip (D) only and takes the place of Table C in the present almanac.

Corrections for Observed Altitude of the Moon (6). This table corrects for refraction (R) and parallax (P) for the center of the moon using the horizontal parallax (HP),

57.0', about average for the year. This table together with the *Additional Corrections* table (4) take the place of Table D in the present almanac. The *Additional Altitude Corrections* table for the moon corrects for SD, and P based on a HP differing from 57.0'.

Additional Altitude Corrections table (4) for Venus and Mars correct for parallax. These corrections are usually disregarded in the present almanac.

If the upper limb of the sun has been observed, correct the *hs* as if the lower limb had been observed and apply corrections given in the table page 250 (not shown here) in the Nautical Almanac. The table, as such,

is not used in the present almanac, because in it the SD for date is given.

*Corrections to *hs* to Obtain *Ho*. (Bubble Sextant).* If the center of the sun or moon has been obtained (as with the bubble sextant), calculate the corrections for the two limbs separately and take the average of the two results, omitting dip corrections.

For stars and planets calculate *Ho* as for a marine sextant, omitting dip corrections.

The methods given above take the place of Tables E and F in the present almanac.

Corrections for *hs* to obtain *Ho* using a marine sextant are summarized below:

Body	Daily pages	Front Cover	Back Cover
Sun	Add'l	Sun's Lower Limb, Ht. of eye	
Moon	Add'l	Ht. of eye	Alt. Corr.
Venus, Mars	Add'l	Stars & Planets, Ht. of eye	
Stars, Jupiter, Saturn		Stars & Planets, Ht. of eye	

In addition, index correction (IC) must be known and applied to all sights.

Example.—On January 1, 1950 the follow-

ing observations are made from a height of eye of 50 feet with a marine sextant having an IC of (+) 1.5'; Sun, *hs* 10°15.2'; lower

Solution:

	+	⊙	-		+	☾	-		+	♀	-
IC	1.5			IC	1.5			IC	1.5		
(4) Add'l	0.6			Add'l	13.7			Add'l	0.4		
(5) Corr	10.7			Corr	37.7			Corr		5.0	
(5) D			6.7	D			6.7	D			6.7
Sum	12.8		6.7	Sum	52.9		6.7	Sum	1.9		11.7
Corr	(+)		6.1	Corr	(+)		46.2	Corr	(-)		9.8
hs			10-15.2	hs			47-23.0	hs			10-33.4
Ho			10-21.3	Ho			48-09.2	Ho			10-23.6
	+	♂	-		+	☆	-				
IC	1.5			IC	1.5						
Add'l	0.0			Add'l	0.0						
Corr			5.4	Corr			5.1				
D			6.7	D			6.7				
Sum	1.5		12.1	Sum	1.5		11.8				
Corr	(-)		10.6	Corr	(-)		10.3				
hs			9-56.0	hs			10-30.2				
Ho			9-45.4	Ho			10-19.9				

limb of moon, hs $47^{\circ}23.0'$; Venus, hs $10^{\circ}33.4'$; Jupiter, hs $9^{\circ}56.0'$; Rigel, hs $10^{\circ}30.2'$.

Required: Ho for each body using the *Nautical Almanac*.

(*Note:* The examples given in this article may not be realistic due to the shortness of the sample tables, but they will serve well as "armchair" problems.)

Notes on solution:

In the *Additional Altitude Corrections* table on the right-hand daily pages, note that the data given for the sun, Venus, and Mars are considered sufficiently accurate for the three days on the page, and that corrections for Venus and Mars change with altitude. Also note that the moon corrections change with date.

When the altitude or height of eye corresponds exactly to the printed value in the *critical* tables found on the front cover and the right-hand daily pages under *Additional Altitude Corrections*, use the upper of the two possible corrections.

On the back cover page, if the minutes of altitude fall between $0.0'$ and $8.0'$, use the first column of corrections; if between $8.0'$ and $15.0'$ use the second column; etc. If the minutes are exactly $0.0'$, $8.0'$, $15.0'$, etc., use the right-hand column of the two possible corrections.

Finding the Greenwich Hour Angle

The Greenwich hour angle (GHA) of the vernal equinox (Υ) and the GHA of the sun, moon, and planets are tabulated at one hour intervals of GCT on the *daily pages* (1), (2). The increase in GHA for additional minutes and seconds is obtained from the *yellow tables* (12).

Example.—Find the GHA of the sun at GCT $10^{\text{h}}44^{\text{m}}03^{\text{s}}$ on January 1, 1950.

Solution:

GCT	10-44-03	Jan. 1
10 ^h	329-08.3	(2)
44 ^m 3 ^s	11-00.8	(12)
GHA	340-09.1	

In order to avoid code corrections (explained later) for the GHA of the sun, the

tabulated hourly values are not entirely correct but become exactly correct when interpolated in the *yellow tables* at the half hour. The maximum tabular error for the sun's GHA is $0.15'$.

Example.—Find the GHA of the moon at GCT $3^{\text{h}}45^{\text{m}}16^{\text{s}}$ on January 1, 1950.

Solution:

GCT	3-45-16	Jan. 1
3 ^h	85-07.7	Code
45 ^m 16 ^s	10-48.1	(+) 109
Corr	8.3	(12)
GHA	96-04.1	

The minimum hourly increase in GHA for the moon is $14^{\circ}19.0'$ and this value is used for calculating the moon column in the *yellow tables*. The *code* number is the hourly variation in GHA minus $14^{\circ}19.0'$ times 10. This *code* number is used as the entering argument in the *yellow code corr'n* columns to obtain the code correction. The code numbers for the moon are always plus (+) and never greater than 180, the highest entering argument in the code correction tables.

Example.—Find the GHA of Jupiter at GCT $8^{\text{h}}45^{\text{m}}17^{\text{s}}$ on January 1, 1950.

Solution:

GCT	8-45-17	Jan. 1
8 ^h	271-16.7	Code
45 ^m 17 ^s	11-19.3	(+) 19
Corr	1.4	
GHA	282-37.4	

The GHA code number for a planet is similar in principle to that of the moon. It is 10 times the amount by which the increase in GHA between 1200 and 1300 of the middle day on the page exceeds $15^{\circ}00.0'$. The code number thus obtained is sufficiently accurate for all hours of the three days on the page. Occasionally, the hourly motion of Venus is less than $15^{\circ}00.0'$, and in that case the code number is minus (−), and the correction will have to be subtracted. The code numbers for planets are given at the bottom of the page.

Example.—Find the GHA of Caph (Star No. 2) at GCT $11^{\text{h}}44^{\text{m}}18^{\text{s}}$ on January 1, 1950.

Solution:

GCT	11-44-18	Jan. 1
11 ^h	265-31.6	(1) Υ
44-18	11-06.3	
SHA	358-22.9	(3)
Sum	635-00.8	
GHA	275-00.8	

To obtain the GHA of a star the formula $GHA\star = GHA\Upsilon + SHA\star$ is used. The $GHA\Upsilon$ here is the sum of 265°31:6 and 11°06:3. The $SHA\star$ is added to these values, subtracting 360° to obtain the GHA. There is no code correction since the hourly increase in GHA for the Υ is constant.

Declination of Navigational Bodies

The declinations of navigational bodies, except stars, are tabulated at one hour intervals of GCT on the daily pages (1), (2). Code numbers with algebraic signs are found at the bottom of the columns. The declination of stars is given for each 3-day period (3).

Example.—Find the declination of the sun, moon, Mars, and Ruchbah (star No. 4) at GCT 4^h45^m18^s on January 1, 1950.

Solution:

Sun			Moon			Mars		
GCT	4-45-18	Jan. 1	GCT	4-45-18	Jan. 1	GCT	4-45-18	Jan. 1
4 ^h	(-)23-03.5	Code	4 ^h	(+)24-40.6	Code	4 ^h	(+) 1-24.2	Code
Corr	(+) 0.2	(+)2	Corr	(+) 5.7	(+)75	Corr	(-) 0.2	(-)3
d	23-03.3	S	d	24-46.3	N	d	1-24.0	N
Ruchbah Star No. 4								
GCT	4-45-18	Jan. 1						
d	59-58.9	N						

The code numbers with algebraic signs for the sun and planets are obtained by subtracting the 1200 tabulated declination from the 1300 tabulated declination for the middle day and multiplying the result by 10. Since the hourly variation in the declination of the moon changes considerably for the three days, the code number (the hourly variation times 10) with algebraic sign, is given for every hour at the right of the table (1). The

declinations of stars change very slowly and the change for a 3-day period is negligible.

Note that the tabulated hourly declination and the *code* correction are combined algebraically in the above solutions. A plus (+) correction means that the body is farther *north* than the tabulated declination and a minus (−) correction means that the body is farther *south* than the tabulated declination.

Example.—On January 1, 1950, the 0445 DR position of a ship is L 30°56.1' S, λ 65°35.1' E. About this time the navigator observes Mars with a marine sextant, as follows: W 4^h45^m06^s pm, WE on ZT 12^s slow, height of eye 52 feet, IC (−) 1.0', hs 57°11.7'.

Required: Solve the observation for a, Zn, and AP.

A complete solution with the *Nautical Almanac* and H.O. 214, Δ d only, using a suggested form is given on the adjacent page.

Tables for *Sunrise, Sunset and Twilight* (7), *Moonrise and Moonset* (8), *Equation of Time* (9), and *GCT of Transit* (10) are given on the right-hand daily pages. These tables are self-explanatory. Sunrise, etc., are given for the middle day and considered sufficiently

accurate for the three days on the page.

"Explanations and Examples" and tables for *Sun's Upper Limb, Conversion of Arc to Time, Latitude by Polaris* and *Azimuth of Polaris* are given on pages prior to the *yellow pages*.

Additional notes on the Nautical Almanac

1. *Yellow Tables* are used only to facilitate arithmetical interpolations.

NAUTICAL ALMANAC AND H. O. 214

DATE	JAN. 1	BODY	MARS	STAR NO.	+ \circ -
W	4-45-06 AM			IC	1.0
WE	(5) 12			ADD'L	0.1
ZT	4-45-18			CORR	0.6
ZD(-)	4			DIP	6.8
GCT	0-45-18	DATE JAN. 1		SUM	0.1 8.4
2h	277-02.8	CODE		CORR	(-) 8.3
15m 48s	11-19.5	(+) 16		CODE	ha 57-11.7
CONN	1.2	TAB	(+) 1-25.5	CODE	Ha 57-03.4
SUM	288-23.5	CORR	(-) 0.2	(-) 3	
GHA	288-23.5	d	1-25.3	N	
a λ	65-36.5	E			
LHA	354-00.0				
t	6-00.0	E			
d	1-25.3	N	d DIFF 4.7		
aL	31-00.0	S			
ht	57-00.2	Δd	(H) 99		2 S 169.0 E
CORR	(H) 4.7				
Hc	57-04.9				
Ho	57-03.4				
a	1.5	A	aL 31-00.0	S	ADV. CN
Zn	011.0	a λ	65-36.5	E	DIST.

2. The Second and Third Correction tables for Polaris have no counterpart in the present almanac.

3. The last digit of a code is in tenths, (code 123=12.3').

4. To find the HP for date, add to 57.0' the value obtained from the daily pages, moon's lower limb, the value for 0° minus the value for 90°.

Example: On January 1, HP=57.0' + (13.1 - 15.0) = 57.0' - 1.9' = 55.1'.

5. To find the SD of the moon for date, read the value on the daily pages for altitude 90°.

6. To find SD of the sun for date, add daily correction for the sun in *Additional Altitude Correction* tables to 15.7', the SD used for sun on the *Front Cover* page.

7. To find RA for bodies except stars at any hour, use the formula $RA = GHA \mp GHA\star$.

8. To find RA of a star subtract SHA from 360°.

9. Note that SHA and Dec. recorded on the inserted sheet are only approximate—Use daily pages for exact values.

10. The dots placed at 3^h, 9^h, 15^h, and 21^h, facilitate the reading of the tables. Note that there are numbers, dots or algebraic signs at each 3-hour interval for declinations of bodies.

11. *Phenomena.* The Nautical Almanac (1950) gives the dates for the phases of the moon, and certain ecclesiastical and secular holidays. This information is found on the lower right-hand corner of the right-hand *daily pages*. Time and dates for solar eclipses are also found in the moon column of the left-hand *daily pages*. A star chart based on the sidereal hour angle is given on the last page of the almanac, where it will be most convenient for reference.



Official U. S. Coast Guard Photograph

THE DEATH OF AN AMERICAN AMMUNITION SHIP

This merchant cargo ship, carrying munitions of war, was hit by Nazi dive-bombers during the invasion of Sicily. Fortunately, other merchant cargo ships carrying munitions in the same convoy were able to deliver the goods.



Official U. S. Coast Guard Photograph

MERCHANT SEAMEN—SOMEWHERE IN THE ATLANTIC

These three were lucky, for a sub-hunting Coast Guard Cutter rescued them in time. Nearly 6,000 other American seamen were lost or died as a result of enemy action during the recent war.

THE AMERICAN MERCHANT MARINE IN WORLD WAR II

By JOHN FORNEY RUDY

HISTORICAL lessons, learned by bitter experience and paid for by human lives, often have a way of becoming lost momentarily in the headlines of the present. The development of atomic power, the advancement in electronics, the important role that aviation plays in the nation's growth, all tend to obscure the contribution of the slower, but nevertheless relentless, pressure of sea power as a vital component of this nation's security.

Without such sea power, historians are agreed, the Allied Nations could not have achieved victory. Moreover, lacking such overwhelming sea power as the United States possessed in World War II, the conflict might very well have been fought on our shores instead of those of the enemy.

An important part of that sea power was the American Merchant Marine, the privately-owned and operated merchant ships that in wartime become our troop transports, our hospital ships, our carriers of stra-

tegic materials, our fleet oilers, our reefers and a score of other types adapted for military and naval usage, and without which war, as it is known now and in the foreseeable future, could not be waged.

The American Merchant Marine met its two assignments in World War II: to knit the ocean-separated United Nations into a single wartime organization, and to place our armies and their equipment on hostile territory and maintain them there.

It wasn't an easy job. It required the building and operation of the greatest fleet of merchant ships the world has ever known. At one time nearly 2,000,000 men and women worked day and night to produce more than 5,000 merchant type ships.

Until the submarine menace was brought under control by the U. S. Navy, losses were heavy; more than 700 American merchant vessels were sunk, nearly 6,000 American merchant seamen had died or were lost, and thousands more were injured or suffered the



U. S. Maritime Commission Photograph

REST HOMES RESTORED MERCHANT SEAMEN TO HEALTH AND DUTY

Thousands of American merchant seamen were injured or sustained war shock in the battle of the merchant shipping lanes. To care for them, the War Shipping Administration maintained rest homes, such as Camp Kittiwake at Pass Christian, Mississippi, shown above.

nightmare of waiting aboard lifeboats and rafts for rescue.

The losses are not hard to understand. Transport was the jugular vein of the United Nations' war effort and thus induced all-out attacks by the enemy. The cost of building and operating our wartime merchant fleets reached a total of more than 22 billions.

By the end of the war with Japan, the staggering amount of more than 200,000,000 tons of cargo and nearly 10,000,000 troops had been carried in American merchant ships. The cargoes ranged from pins to locomotives, and comprised most of the naval and military tools of destruction and construction.

The majority of the merchant fleet was under direction of the War Shipping Administration, operating through experienced shipowners acting as agents of the Government. Approximately 75% of the nearly 60,000,000 deadweight tons of merchant shipping in World War II was allocated to Army and Navy cargoes. Thus the Armed Services were at all times the Number One customers of the Merchant Marine.

Today history records how the military powerhouses of Africa, the United Kingdom, and the South and Southwest Pacific were built up so that the successive thunderbolts of Allied naval and military power could be thrown to destroy first Italy, then Germany,

and finally Japan. Ships of the American Merchant Marine delivered the goods.

Summarizing the value of the U. S. Merchant Marine to the naval and military forces, it is clear that the Merchant Marine must be viewed as a whole—the ships, the shipowners and operators, the shipbuilders, the port and repair facilities, the marine suppliers, the shipworkers, the officers and seamen—all a unified, flexible whole which resulted in an adequate cargo-carrying and troop capacity available at the time, the place, and in enough strength to carry out the logistical processes of the greatest war in history. This concept has never been better stated than by Fleet Admiral Ernest J. King who, on November 2, 1945, declared:

"During the past 3½ years, the Navy has been dependent upon the Merchant Marine to supply our far-flung fleet and bases. Without this support, the Navy could not have accomplished its mission. Consequently it is fitting that the Merchant Marine share in our success as it shared in our trials.

"The Merchant Marine is a strong bulwark of national defense in peace and war, and a buttress to a sound national economy. A large Merchant Marine is not only an important national resource; it is, in being, an integral part of the country's armed might during time of crisis. During World War II, this precept has been proven."



Official U. S. Navy Photograph

U.S.S. WASHINGTON REFUELING FROM U.S.S. KASKASKIA

It was the merchant type oiler, such as the *Kaskaskia*, above, that made possible the tremendous refueling operations that gave the U. S. Fleet the cruising endurance demanded by modern warfare.



U. S. Maritime Commission Photograph

A TORPEDO IS A NASTY DEVICE

This photograph illustrates what a single Nazi torpedo could do to an American Liberty ship; it also illustrates that American officers and crew were able to get their ship into port for repairs and continued service in the nation's war effort.



Official U. S. Coast Guard Photograph

200,000,000 TONS OF CARGO, 10,000,000 TROOPS

The never-ending parade of merchant transports and cargo ships, such as these on their way to the South Pacific battle lines, are symbolic of the stupendous transportation role played by the American Merchant Marine in World War II.



War Shipping Administration Photograph

BOUND FOR THE "SOFT UNDERBELLY"

It isn't enough that this tanker should deliver her usual capacity load of oil and gasoline. In addition she carries a deckload of combat planes, which were being off-loaded in a Mediterranean port when this photograph was taken.



Official U. S. Coast Guard Photograph

AERIAL BOMBS FOR ENEMY WAR PRODUCTION CENTERS

U.S. merchant ships carried every conceivable kind of cargo in World War II. The heavy air-strikes kept many merchantmen busy—tankers with fuel, cargo ships with munitions and parts, transports with support personnel.



U. S. Maritime Commission Photograph

A LOCOMOTIVE GOES TO SEA

This is only one of many locomotives that travelled on the deck of a Victory ship en route to one of our major Pacific bases. The man at the rail is an Army "nursemaid" for the big engine.



Official U. S. Navy Photograph

TORPEDOED AMERICAN TANKER

The Nazi sub captain probably counted this a sure sinking. Despite raging fires, however, crew members brought the flames under control and the tanker was towed to port by a U. S. Navy ship.



Official U. S. Coast Guard Photograph

BLOWN IN TWO BY A NAZI SUB PACK

Struck off the Florida coast, her stern and bow sections found floating miles apart by the Coast Guard Cutter which sank them to clear the sea lanes of a navigation hazard, the tanker was trying to deliver a cargo of over 5,000,000 gallons of high test gasoline.



Official U. S. Coast Guard Photograph

DUCKING THE NAZI DIVE BOMBERS

Pre-war luxury liners of the merchant marine, converted into troop transports, had to fight for their lives against the Stukas off Sicily. Dexterous handling brought the great majority through, though some were lost and many showed the damage of near misses.



Official U. S. Coast Guard Photograph

TRAGEDY OF THE NORTH ATLANTIC

It is little wonder that with the billions of gallons of gasoline and oil needed to lubricate the sinews of the Allied war effort, the German submarines gave top priority to tankers. A total of 700 American merchant ships failed to reach port in World War II.



U. S. Maritime Commission Photograph

VICTIMS OF THE BATTLE OF THE ATLANTIC

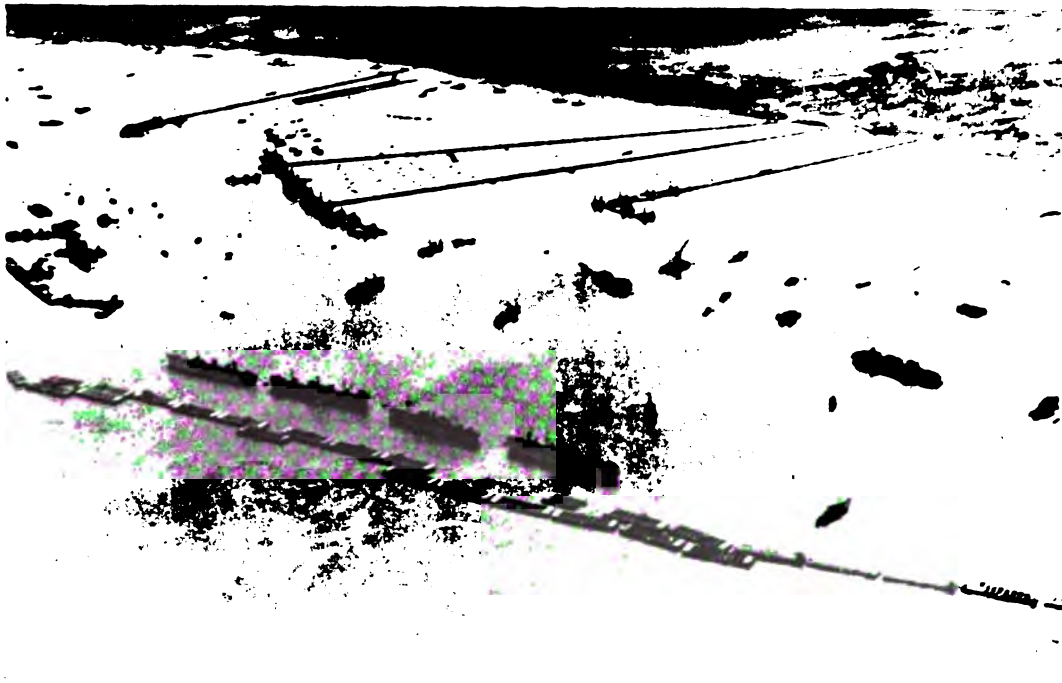
This modest cemetery in Iceland marks the last resting place of a few of the officers and seamen lost in the North Atlantic during the winter and spring of 1942. In those cold, rough waters, rescue came at once or it was too late.



U. S. Maritime Commission Photograph

THE CONVOY SYSTEM WORKED

Seen from the escort protecting them, these Liberty ships and tankers are delivering the goods. Without the convoy system there was no way by which the great industrial might of the United States could be brought to bear upon the enemy.



British Official Photograph

THE FAMOUS "MULBERRY" OPERATION

This general view of the British prefabricated harbor on the Normandy coast shows Liberty ships at moorings in the foreground inside the concrete caissons breakwater and the main discharge piers flanked by special barge and LST piers.



Official U. S. Navy Photograph

INVASION OF SOUTHERN FRANCE

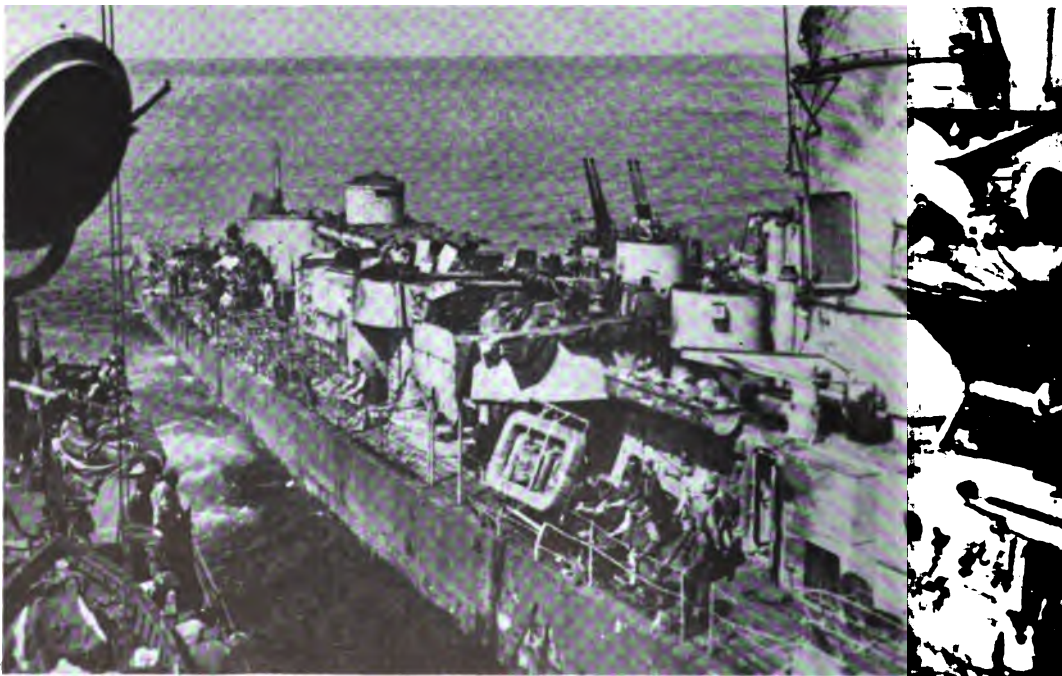
This panoramic view of warships and merchantmen suggests the power that was concentrated against the Nazis even at a time when logistic problems of even greater magnitude were being solved along the Channel.



Official U. S. Navy Photograph

U.S.S. *LAFFEY* AFTER KAMIKAZE ATTACK

Only those who served on the picket line off Okinawa can understand the peculiar Hell this ship has come through.



Official U. S. Navy Photograph

PCE(R)851 PULLS ALONGSIDE

Casualties were removed from the *Laffey* and soon received all help possible in the 80 bed hospital of the PCE(R). Three of these rescue ships shared the nightmare of the picket line.



DISCUSSIONS COMMENTS NOTES

PCE(R) 851 Stood By the Laffey

(See page 997, September 1949 PROCEEDINGS)

LIEUTENANT COMMANDER F. S. BAYLEY, JR., U.S.N.R. (INACTIVE).—I read with great interest the article entitled "79 Minutes on the Picket Line," in the August issue of the PROCEEDINGS. I note that there appeared to be no pictures of record of the *Laffey*. I enclose four snapshots which were taken from the U.S.S. *PCE(R) 851* shortly after the *Laffey* was hit, on RP one. The negatives of these pictures were forwarded to the Navy Department in the usual course by our ship's photographer. These copies were retained by me as commanding officer.

The *PCE(R) 851* was a rescue ship and during our stay at Okinawa we took care of the northerly picket stations. We had an eighty-bed hospital with surgery and X-ray and our facilities were frequently overtaxed with casualties and survivors of the picket ships.

It has been a matter of some interest to me that the story of the *PCE(R)* class has never been told, particularly in view of the constant duty we had on or in the immediate vicinity of the picket stations. My ship went through the Philippine campaign, Iwo Jima, and at the time of my relief as commanding officer, had for 65 days performed, in the words of Commodore Moosbrugger, "Many heroic rescues of wounded personnel from alongside burning and sinking vessels," at Okinawa. There were three of these ships at Okinawa and their services were almost continuously in demand. With a top speed of 16 knots, with very limited gun power and no air search radar, the maintenance of an isolated station required the crew to be at battle stations for almost 24 hours a day and 7 days a week. The trips back from the picket stations, with the hospital filled with

the wounded, without any air cover or escort, were made frequently and without damage to any of the *PCE(R)*'s.

(EDITOR'S NOTE: Two of the photographs mentioned above are reproduced on the opposite page.)

More on the *Laffey*

(See page 997, September 1949 PROCEEDINGS)

LIEUTENANT COMMANDER BENJAMIN D. HYDE, U.S.N.R. (INACTIVE).—In my twelve odd years as a reader of the PROCEEDINGS I don't believe I have seen you publish anything much better than "Seventy-Nine Minutes On the Picket Line" as appearing in your September, 1949 issue.

As the former C.O. of a ship that spent some forty odd days and nights in the same picket line with the *Laffey* this writer can testify that your story has succeeded in vividly reconstructing those nerve racking days.

What a pity that some of the younger generation in our schools cannot read this story and others like it. This is the kind of history that they would read as long as they could continue to find more material, and perhaps in these days of cynical politicians and power-hungry unions such history would have an invaluable place in the curriculum!

As many of us know, the story of the *Laffey* was repeated fifty or maybe a hundred times in the Okinawa Operation alone, and many other times at Leyte Gulf and other places, but aside from their immediate effect on some current operation, they have a long range importance and value to the future of this country which must not be lost. Even though the names of the famous ships in your story might be meaningless to some youngster ten years hence, I am sure the story itself would never be forgotten!



Official U. S. Coast Guard Photograph

LOGISTIC SUPPORT IN THE MEDITERRANEAN

This busy scene may be disrupted at any moment by the attack of Nazi dive-bombers. But the little publicized salvage workers kept the harbors navigable and the shipping moving the world around.



BOOK DEPARTMENT

Both regular and associate members of the Institute may save by ordering books through the Book Department. A discount of 10% is allowed on books of other publishers (except on foreign and government publications, and on books on which publishers do not give a discount). Allow reasonable time for orders to be cleared and books to be delivered directly to you by publishers. Address Secretary-Treasurer, U. S. Naval Institute, Annapolis, Maryland.

NO BANNERS, NO BUGLES. By Commander Edward Ellsberg. New York: Dodd, Mead & Company. 1949. 370 pages. \$4.00.

REVIEWED BY CAPTAIN G. V. STEWART,
U. S. NAVY (Ret.)

When I had read the first few chapters of this book, I found myself critical of the contents for reasons I could not readily understand. So, I reread them and decided that the style was wordy with a tendency to repetition.

There was no doubt left in my mind that Massawa in Africa is not attractive as a summer resort.

Then I became absorbed in the story of the work which was done by Ellsberg and his crew, and the book became for me an engrossing recital of the gruelling work in war that has to be done and always is done if the spectacular and blazoned feats are to be accomplished.

Since the various jobs of salvage were set down in this chronicle in sequence as they occurred, it was no writer's trick that began early and critical salvage on the *Spahi* with its accomplishment interrupted and delayed beyond all reason to make for suspense that would do justice to a mystery novel.

In doing the tasks allotted, Ellsberg and his subordinates demonstrated the highest order of resource, ingenuity, and technical

knowledge, plus great courage and incredible patience under exasperating circumstances.

The author's frustrations and the irritations provoked by the French Commandant in the port of Oran I can understand, for that official was a newly acquired ally of questionable conversion, but I can make no allowance for a General of our own Army who refuses a minor cooperation with another part of his own country's forces because he is overconscious of his rank and dignity. No naval officer but Ellsberg would have been as dutiful, subordinate, and respectful to an Army Area Commander, I am sure.

Ellsberg tells the story straightforwardly of what happened to him and his men rather than what they did to help win the War. The book cannot but be of interest to men of the Navy and Merchant Marine and of particular appeal to officers who may be assigned to Damage Control duties.

I am wondering if the author may have reduced his knowledge and experience of ship salvage and damage control to a manual of instruction. If so, I have never heard of it nor do I know of such a treatise by any expert. It would seem that Ellsberg could render the Navy and the sea-going world great service by producing a textbook on the subject.

Aside from the foregoing, it is a book that anyone might read with interest and benefit

as an example of what men do and undergo for their country unheralded in war when there are *NO BANNERS—NO BUGLES*.

IF RUSSIA STRIKES. By George Fielding Eliot. New York: The Bobbs-Merrill Company, Inc. 1949. 252 pages. \$2.75.

REVIEWED BY CAPTAIN WILLIAM R.
SMEDBERG III, U. S. NAVY

If Russia Strikes is a particularly interesting and valuable book for a military man, Army, Navy or Air Force, because whether he agrees with the opinions and prognostications of the author or not, his knowledge of foreign areas will be increased, his understanding of the difficulties and problems which are besetting all nations today will be bettered, and he will find himself in possession of a more comprehensive over-all view of the world situation as it appears to a man who has devoted considerable study to it.

Major Eliot considers that it has been reasonably established as the major premise of Soviet policy, the conviction in the minds of the leaders in the Kremlin, that the Soviet regime, as it is now constituted, cannot live in peace and security with free states, much less co-operate with them fruitfully for common ends. He therefore conceives them to be at war with the Western World right now, waging a cold war in which every device of Soviet diplomacy and propaganda is being employed to break apart the solidifying front of Western unity. He sees five major Soviet objectives, which he refers to as the fronts on which their offensive is being conducted. These fronts, or objectives, are listed as:

- The control of Germany,
- Consolidation of the satellite states of Eastern Europe into a solid group of Soviet republics,
- Expansion in Asia,
- Control of the Middle East, and
- Prevention of recovery, coupled with promotion of political and economic instability in non-Soviet countries.

From the vigorous and apparently successful offensives on all these fronts in 1945 and 1946, the Russians have watched that offensive control gradually pass into Western hands on several of those fronts. If the

Soviets feel that they are indeed losing the cold war, the author poses the question of whether their leaders can afford to lose it without trying the alternative of actual war. Therefore it is his contention that the year 1949 is not only one of grave uncertainty but of actual danger, during a period in which the unity of the Western World and the military security of its several parts are not yet accomplished facts. He feels that the men in the Kremlin are fully aware of this and must now be weighing the factors upon which they will base their final decision: to strike before another year has given the Western World greater safety and greater unity, or to wait. There appears to be no doubt in Major Eliot's mind that, with the structure and character of the Soviet state as it exists today, Russia will either strike in 1949 because the dominant factor in the Kremlin can endure the strain no longer, sees the cold war lost, and chooses real war as preferable to the acknowledgment of failure, or will await the day when significant quantities of the atomic bomb will be under Soviet control, at which time Russia will be in a position to make demands to which the rest of the world must yield or face the immediate prospect of horrible atomic war.

An attempt has been made in this book to give the reader some conception of the complexities and uncertainties which attend not only the conduct of war, but the conduct of the policy of a free nation in time of peace. It contributes to a conviction that the foreign and military policies of the United States are inextricably linked together, and that neither can be sound unless the considerations of the other are taken into almost daily account.

CONFLICTING PATTERNS OF THOUGHT. By Karl Pribram. Washington, D.C.: Public Affairs Press. 1949. 176 pages. \$3.25.

REVIEWED BY ASSISTANT PROFESSOR
THOMAS P. CARPENTER, U. S.
NAVAL ACADEMY

Dr. Pribram's closely reasoned and compactly written book can never become popular in the sense that *One World or None* did, although it deals with the same urgent sub-

ject. Short as it is, the treatise makes exhausting demands on the reader, who must have at least a fair knowledge of current events, geopolitics, and the history of Western world philosophy in order to follow Dr. Pribram at all. The style itself, although more fluent than that of so exacting a book as R. H. Tawney's *Religion and the Rise of Capitalism*, is almost equally laden with abstract terms, scholarly notes, and academic dicta. Nevertheless, patient attention will bring the reader to the last of these heavily freighted pages with a better understanding of the long and terrible conflict of national policies which has culminated in the Cold War.

Dr. Pribram holds that the fear and hate which compel men to ravage one another's fields and cities originate in a set of abstractions, that is, in differences in the *methods* used when basic social concepts are formed. He names the four leading social philosophies as follows: the scholastic, the individualistic, the nationalistic, and the Bolshevistic. Plausible exemplifications would be the medieval Church, the American theory of freedom, Fascism, and Russian Communism. The "patterns of thought" to which these belong are respectively what Dr. Pribram calls the universalistic, the nominalistic, the intuitionist, and the dialectical. Roughly simplifying his carefully detailed exposition, we can say that the differences in these patterns arise from irreconcilable beliefs as to what the human mind is capable of doing. Thus universalism insists on the notion of basic ideas which are inherent in the mind; nominalism uses fluid, hypothetical concepts which may be amended at almost any time; intuitionism relies on "inner light" and flashes of insight; and dialecticism interprets all phenomena in terms of an evolutionary process which is kept in train continuously by basic antagonisms. It is easy to see that these four patterns are widely divergent. Dr. Pribram has no difficulty in showing

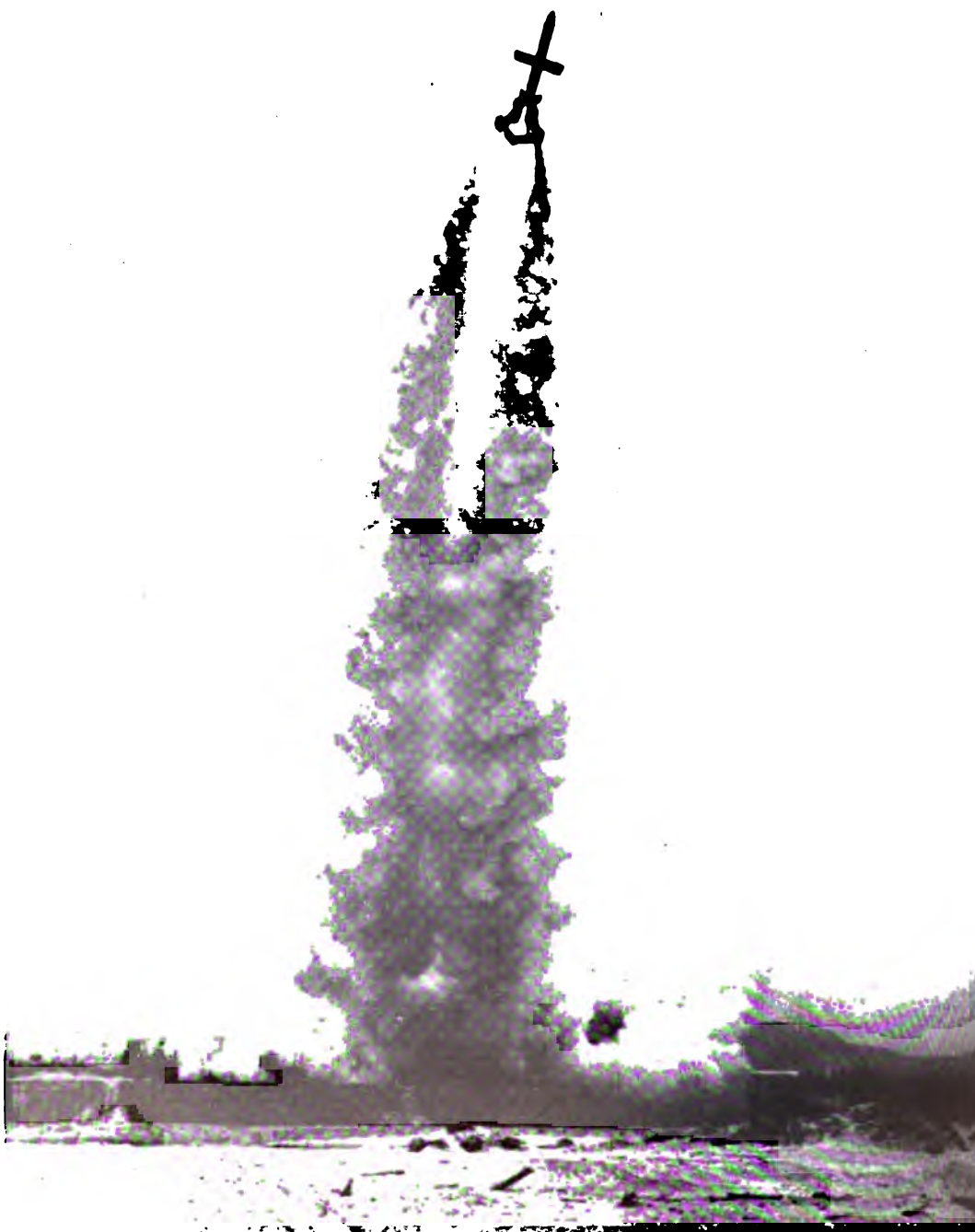
that the differences are highly practical and have led directly to the most dreadful events.

Without giving up the dry objectivity of his academic detachment, the writer mentions a few familiar horrors and leaves the reader to complete the list. Once the point is grasped, it becomes clear that the wavering but precious progress of American government is full of examples of nominalism (such as the passage and repeal of the Eighteenth Amendment); that Hitler's intuitionism led straight to Rotterdam, Stalingrad, and Buchenwald; and that the Kremlin's dialecticism logically involved the frightful programs of "liquidation" as well as the present maddening intransigence of the Soviet Union. Concerning that chronic intransigence, Dr. Pribram explains grimly, ". . . the doctrine of materialistic dialectics does not permit any lasting peaceful conciliation of fundamentally antagonistic forces. It permits only temporary understandings, resorted to for strategic reasons . . ." (Page 159).

In a rapid and bold survey, the author shows how these divergent patterns of thought affect *all* aspects of a nation: the political, the economic, the scientific, the artistic, the military—thus the list prolongs itself. He does not mention the notorious Lysenko controversy nor the recent punishments of Russian composers; the examples arise instantly in the reader's mind. So far as he takes sides, Dr. Pribram is a supporter of nominalism, but he freely admits that of all these four patterns of thought nominalism (which underlies so important a force as United States foreign policy) is least capable of two things very important in world affairs: long-range planning and speedy action.

The essay ends with a mildly-worded but unmistakable call to arms addressed to the scientists, educators, politicians, and publicists who understand the values of nominalistic thought. They must explain and combat the fallacies underlying Bolshevik doctrine.





Official Department of Defense Photograph

NEW NAVY SURFACE-TO-AIR GUIDED MISSILE

The *Lark*, powered by a liquid rocket engine, has reached the developmental testing stage. Smoke trails visible in the picture are from booster rockets used to accelerate the missile up to its flying speed.



(THROUGH OCTOBER 24, 1949)

UNITED STATES.....	1420
Fleet Exercises—China Holds Ships—NGF Anniversary	
GREAT BRITAIN.....	1423
Subs for Australia—Amphibious Demonstration—Various Notes	
FRANCE.....	1425
Comment on Combined Fleet Exercises	
U.S.S.R.....	1426
U. S. Escorts Returned—Rocket Output—Story of Atom Test	
OTHER COUNTRIES.....	1429
India—Italy—Japan	
AVIATION.....	1430
P2V Record Flight—D-558-2 Record—Skyrocket Sequel—Air Transport for Sick—Mars Return—New British A/S Aircraft —Air Exercise Over Britain—Russian Airliner	
MERCHANT MARINE.....	1433
Soviet Merchant Marine—Ship Race	
INTERNATIONAL.....	1434
Exercise “Agility”	
SCIENCE.....	1435
Radiation Detector—Mapping Ocean Temperatures	

UNITED STATES

Fleet Exercises

New York *Herald Tribune*, Oct. 22.—The Navy will match nineteen "enemy" submarines, augmented at times by land-based planes, against a 100-ship armada next month in the largest peace-time maneuvers ever held in the North Atlantic waters.

In one phase the undersea fighters will try to turn back the 2d Task Fleet in its attempt to run from the Virginia Capes to a point south of Argentina, N. F.

In another phase the "enemy" submarines, including the new guppy-snorkel type, will strive to block the armada's passage into the Davis Straits, between Greenland and Newfoundland.

The fleet includes the major aircraft carriers *Midway*, *Franklin D. Roosevelt* and *Philippine Sea*, forty-nine destroyers, four cruisers and various minesweepers, tankers and supply ships, in addition to its hunter-killer anti-sub force headed by three smaller aircraft carriers, the *Wright*, *Mindoro* and *Siboney*.

The opening phase of the three-week maneuvers, Oct. 31 to Nov. 23, will take the fleet and its undersea "attackers" as far north as the Arctic Circle for cold-weather training.

During the latter part of the maneuver, the "enemy" submarines will be joined by land-based aircraft in opposing attacks by the fleet and its carrier planes against simulated "enemy" airbases on the East Coast.

In this phase, the naval air stations at Quonset Point, R. I., and Atlantic City will be designated "enemy" bases under attack by the fleet and its carrier planes.

A land-based Navy bomber, of the long-range Neptune type, will fly out to make a mock atomic-bomb attack on the fleet. A flare will simulate the fearsome weapon.

More than 42,000 surface sailors, naval aviators and submariners will take part in the maneuver.

The maneuver will be directed by Vice-Admiral Donald B. Duncan, commander of the 2d Task Fleet, from aboard his flagship, the *Franklin D. Roosevelt*.

The "enemy" submarine force will be directed by Rear-Admiral James Fife, com-

mander of the Atlantic Fleet's submarine force.

New York *Times*, Oct. 23.—Fifty thousand American soldiers and sailors, engaged in the biggest amphibious maneuvers since the war, sparred in long-range combat across an expanse of ocean today preliminary to a simulated invasion of the main Hawaiian island of Oahu early next week.

The attacking fleet of some ninety vessels, which sailed from San Diego, Calif., Oct. 14, carrying the Second Infantry Division, was found today by shore-based patrol planes and, later, retaliating carrier-based planes from the approaching flotilla zoomed high over the heads of oblivious residents here.

There was not even a hypothetical suggestion of the Pearl Harbor attack of 1941 in the situation. However, the approaching "Western Task Force" is a theoretical liberating force from the mainland assigned to oust from the island entrenched forces of a hypothetical enemy called "Aggressor."

This is the same hypothetical enemy which American forces have combatted for several years back in maneuvers all over the United States and for which the Army maintains a staffed "headquarters" at Fort Riley, Kan.

THE ISLANDS ARE "OVERRUN"

"Aggressor" has its own flag, a green triangle on a white ground; its own weapons, notably quickly inflatable rubber balloon tanks and guns; its own uniforms and even its own language; its theoretical geographical origin is southwestern Europe; its language an informal amalgam of English, French, Spanish and Italian designed to give practice to intelligence officers.

In theory "Aggressor" forces overran all the Hawaiian islands the week of June 12. Its units on Oahu are being represented by 9,000 Army and 3,000 Navy personnel regularly stationed in the islands under the command of a fictional "General of Corps Edouard Bocquet."

Actually the commander is Lieut. Gen. Henry S. Aurand, Commanding General of the United States Army of the Pacific.

The "Western Task Force" is under the command of Vice Admiral Gerald F. Bogan, actual commander of the First Task Fleet and author of the recent controversial de-

partmental memorandum on morale in the Navy.

The over-all exercise, entitled "Miki" (Hawaiian for "preparedness"), being carried out by a joint Army, Navy and Marine staff, is under the United States Sixth Army based at the Presidio, San Francisco.

"Aggressor" submarines intercepted the invading force by official arrangement when it was only 170 miles off the California coast, and the defensive troops here are intensely on the alert. "Aggressor" guards even assiduously held up a party of duly accredited "war" correspondents at the gate of the Pearl Harbor reservation for fifteen minutes yesterday morning, suspicious that they might be "enemies" in disguise.

Despite such vigilance a small, invading reconnaissance party got ashore by night via submarine, rubber boats and swimming, and checked in with an umpire on the beach.

The defenders know officially that there will be a landing at specified points on Pokai Bay, but do not know when it will come. It is prearranged also that, outnumbered by around 5,000 men, they will be routed. The main problematical element is how proficiently the landing will be executed with large or small casualties.

Normal uncertainties of even mimic warfare had necessarily been sacrificed, maneuver officials explained, in order to insure contacts between the opposing units and to give a maximum of practice to the forces involved.

LIMITATIONS ON THE EXERCISES

Due to the extensive settlement along the shores of Oahu there could be little latitude in the invasion area, and for the same reason there are stringent limitations on maneuvering once the troops are on shore.

On-shore maneuvers, it was noted, could be conducted on the mainland whenever desired.

Hence, as unglamorous as it may seem from a lay standpoint, the exercise does not amount to, and was not conceived as, a real "war game" in which there could be all-out competition and an all-out winner.

"It is desired to emphasize," an official announcement summarized, "that reports of naval elements sunk, aircraft destroyed or

casualties among Army ground forces which ignore the artificial controls necessarily imposed upon the exercise give a distorted picture of the capabilities of both attacking and defending forces."

Nonetheless, officers said that "Miki" already had demonstrated great value as an exercise in joint planning by the different services, especially in the light of the unification controversy.

Merchant Ships "Kidnapped"

New York Times, Oct. 3.—Shanghai,—The Nationalist Navy today "kidnapped" the two United States merchantmen that were detained as they left Shanghai last Thursday and took them to the naval base in the Chu Shan Islands, the ships' agent here, A. P. Pattison, said today.

He said the *Flying Independent* reported she had been ordered to follow two former United States Navy warships to the Kuomintang naval base. Fifteen minutes later, he said, the larger of the two warships sent a similar order to the *Flying Clipper*, stating, "You must follow me by order of my Government. If not I will fire on you."

A dozen British, United States and Norwegian passengers, including several prominent Shanghai businessmen, are aboard the ships, as well as 125 Korean repatriates and 9,000 tons of cargo. Mr. Pattison put the value of the cargo at "several million dollars." He said the Koreans had brought enough food for the trip to the homeland but that the supply had been exhausted, making them dependent on the crew's limited food stocks.

ON THE HIGH SEAS

The two merchantmen and their escorting warships are on the high seas outside Chinese territorial waters now, Mr. Pattison said. They had been seized inside the twelve-mile limit. The warships are the destroyer escort *Tai Ho* and the minesweeper *Yung Ting*, according to Mr. Pattison.

Of the two smaller British ships similarly seized, one, the *Edith Moller*, had been stripped of her cargo at Chu Shan before being released, according to British shipping circles here. The other, the *Leong Bee*, last radioed that she had been released with her



Official Department of Defense Photograph

PLANS FOR THE WORLD'S MOST POWERFUL RADIO STATION

This photograph shows the actual site at Jim Creek, Snohomish County, Washington, of the 1,000,000 watts, all-weather station for Pacific communications. The overlay gives details of the proposed installation.

cargo still aboard. The usually conservative British newspaper here, *The North China Daily News*, has repeatedly referred to these seizures as outright "piracy."

The unloading of the cargoes of the United States ships belonging to the Isbrandtsen Company, however, would present difficulties. The Chu Shan Island Harbor of Tanghai is not believed to be very deep by shipping men here, and even if the ships can get inside there are no facilities for handling cargoes of thousands of tons.

A third ship of the same company, the *Flying Trader*, was reported still waiting off the entrance to the Yangtze for an order from the company to enter Shanghai. The blockade has been declared illegal by the United States Government, but until the two outbound ships are set free the shipping

company may not want to risk sending another ship in.

Naval Gun Factory Anniversary

New York Times, Sept. 26.—Washington, Sept. 25.—The Navy opened a week-long celebration today in paying tribute to the 150th birthday of the naval gun factory here, the world's largest naval armament plant.

Virtually all the bureaus and elements of the Navy from land, sea and air units will take part in unfolding the story of the Navy, from round shot to rockets, during the commemoration that ends Oct. 2, the anniversary date.

Exhibits ranging from the little "Long Tom" of Revolutionary days to the gun that fired the last salvo at the Japanese will be on display. Demonstrations will be

given by underwater demolition teams, Marine Corps jet planes, tennis stars and the Navy Band.

Using the same type powder and shot as were used then, an old gun firing a 32-pound ball will be discharged by a hand-picked crew of men dressed as were their naval ancestors.

It was this type gun, with a 100-yard range, that was produced a century and a half ago by the gun factory. Some guns of recent years fire shells weighing approximately 3,000 pounds, ranging some 25 miles.

But producing guns is only one of the two big jobs done at this huge plant. The other part of the job consists of basic research into rockets and rocket launchers, fire control and optical equipment, catapult guns, depth-charge projectors and miscellaneous special weapons. With the announcement of the atom explosion in the Soviet Union, too, it is believed that the development of ground-to-air interceptor missiles for defense against enemy bombers will be pushed.

When the fleet needs a new-type weapon the Bureau of Ordnance and its laboratories develop the required plans. These are turned over to the gun factory for production. Some, however, may be handled by private industry, with the gun factory acting as consultant.

The gun factory is a large, ultra-modern industrial plant under the shadow of the Capitol. Over 10,000 civilian employees use the up-to-date equipment to produce the finest naval ordnance in the world. The payroll of these engineers, scientists, artisans and clerks reaches an estimated \$15,000 an hour.

The gun factory was founded on the banks of the Anacostia River as a shipbuilding and fitting-out yard, since its docking facilities could accommodate the largest naval vessels of that time. During the War of 1812 much of the Navy Yard, as it was known then, was destroyed by its own officers to prevent its destruction by the British.

Shipbuilding in 1840 became a minor activity. Steamships were beginning to displace sail, and the deeper harbors and closer access to supplies of iron, steel and coal that these required made it desirable to shift major construction work to the coast cities.

JAPANESE ENVOYS VISITED

Navy Yard history continued without incident until the picturesque visit, in 1860, of the first Japanese envoys to the United States, returning Commodore M. C. Perry's visit to their country. The Yard also played a part in the tragedy of Lincoln's assassination, when in 1867 a naval ship returned to its dock with John Suratt, one of the conspirators, a prisoner on board.

Gradually the mission and functions of the Yard—it was officially renamed in 1945—changed with the times. It has a long record of inventive progress. One of the most famous achievements of the Yard was the rapid design and completion of the naval railway guns for use against the German armies in France during World War I.

The factory also has a long record of odd jobs. It once built 100 gun carriages as a gift for the Sultan of Morocco. It built at one time cuspidors and ash trays for Congressmen, the gears to operate the Panama Canal locks and the Roosevelt bomb shelter at Hyde Park. Maintaining the subway from the Senate Office Building to the Senate, the Presidential yacht and railway car are among the many charges of the plant.

One of the outstanding events of the week will be the water parade made up of large and small yachts, canoes, sailboats, powerboats and military craft. Approximately 100,000 people are expected to watch it.

GREAT BRITAIN

Submarines for Australia

London *Times*, Sept. 28.—The Commonwealth Government has accepted the offer of the Admiralty to base three modern submarines in Australia to train Australian and New Zealand naval men in anti-submarine warfare.

The first two submarines, the *Telemachus* and *Thorough*, will leave Britain early in November and should reach Sydney in January. They will be based at Sydney and placed on the establishment of H.M.A.S. *Penguin*. The third will follow later. Each submarine will carry a crew of about 60, but the Admiralty will provide a spare crew and most of the base maintenance staff of about 15.

Mr. W. J. F. Riordan, Minister for the Navy, explained that the acquisition of the aircraft-carrier *Sydney* necessitated the provision of facilities for anti-submarine training in Australia, as submarine hunting was the task of the *Sydney's* Firefly aircraft. Crews of destroyers and small vessels should also be trained in submarine detection. Until now the Royal Australian Navy had carried out only periodic anti-submarine exercises with the help of visiting submarines from the Far Eastern Fleet.

Amphibious Demonstration

London *Times*, Sept. 29.—Eastney, near Portsmouth, was the scene of an invasion from the sea yesterday afternoon, when the Amphibious School maintained by the Portsmouth Group of the Royal Marines, under the command of Major-General Leech-Porter, staged a demonstration of the methods of Combined Operations for the benefit of officers studying at the Army Staff College, Camberley. About 100 other officer spectators attended, including Lieutenant-General Roberts, G.O.C.-in-C., Southern Command, and a number of representatives of the Press. Another group of officers will see the same performance to-day if weather permits.

The demonstration began with a reconnaissance of the beach, which, in the real thing, would have been made in darkness, probably occupying many nights. The chief actors were two officers, one from the Navy, the other from the R.E. They approached the beach in canoes and slipped into the sea—miraculously without capsizing their flimsy craft—a few yards from the water's edge.

The naval officer made a detailed survey of the inshore strip of sea, swimming on his back while taking soundings with a hand lead-line and recording them on a waterproof note-pad, and locating any submerged defenses or booby-traps. His soldier comrade did similar work ashore, collecting specimens of the soil for subsequent analysis to determine what vehicles it would bear. They then swam out to their canoes, which were waiting offshore with their paddle-men. During the war such detailed reconnaissances were ac-

tually made, unobserved, up to within a few yards of enemy sentries.

Light relief was provided by the landing of an "agent" from a rubber dinghy—an easier craft for a land-lubber. On landing he discarded his waterproof overalls to appear, garbed in striped blazer and straw boater, indistinguishable from a normal, if rather Victorian, summer visitor, so that he was able to plant an explosive suitcase almost at the feet of the v.i.p.'s watching the performance.

The assault proper was preceded by a week or so of imaginary heavy bombing of the whole area, and three hours'—again imaginary—naval bombardment. The latter ceased 10 minutes before the first craft were due to ground, though a bombardment by rockets fired from L.C.T.'s off shore continued for another six minutes.

The first craft seen approaching the beach appeared to be small open boats, but as they grounded canvas screens dropped and they were revealed as Sherman tanks which, lying awash where they touched, at once took up the bombardment just suspended from farther out. Next, L.C.T.'s nosed in to the beach, opened their bow doors and disgorged "Beach Armoured Recovery Vehicles," tank-like craft whose function, like that of the men who accompanied them on foot, was to clear the obstacles, explosive or passive, on which the defense relied to hold up invaders.

After these, and yet only a few minutes after H hour, came the first assault wave of infantry—drawn on this occasion from The Lancashire Fusiliers, who happened to be the regiment most conveniently placed. The second wave followed 17 minutes later—an example of the intricate and meticulously accurate time-table to which the whole operation worked.

Beach parties and beach development parties, and other formations with special functions and special apparatus, followed each other in regular progression. The beach was quickly transformed from a rough terrain, strewn with obstacles actually used by the Germans in Normandy, whence they were brought, to a well-marked, fully cleared and organized landing-place.

All the time aircraft—Fireflies from H.M.S. *Theseus*—were overhead, swooping on the targets to which they were directed by R.A.F. control officers. Shell-bursts were simulated by small pre-planted explosives, and the whole operation was explained—when his voice was not drowned by a helicopter vainly trying to bring a brigade commander ashore from his ship—by the officer concerned with the particular phase of the operation then being illustrated.

Everything went to programme, except that one L.C.T., commissioned only a week before, had some trouble with her bow doors. One assault landing-craft simulated a casualty, but a tractor-drawn "Miller" crane appeared, lifted her out of the water, and took her away clear of the landing beach. The whole demonstration was a convincing illustration of the high degree of inter-service cooperation that has now been developed and of the intricacy of the planning and staff work needed in such operations.

VARIOUS NOTES

Exercise in South African Waters

London *Times*, Sept. 15.—Sea exercises in the Saldanha Bay area, 70 miles north of Capetown, in which land-based squadrons of the South African Air Force took part, have just concluded after more than a week's work. Ships of the Royal Navy engaged were the cruiser H.M.S. *Nigeria*, Captain W. P. Carne, flagship of Vice-Admiral E. D. B. McCarthy, Commander-in-Chief of the South Atlantic Station, the sloops H.M.S. *Actaeon* and H.M.S. *Nereide* and the Fleet tug H.M.S. *Briton*. The South African Naval Force contributed the frigates H.M.S.A.S. *Good Hope* and H.M.S.A.S. *Transvaal*.

London *Times*, Sept. 20.—Malta.—The aircraft-carrier H.M.S. *Ocean*, 13,190 tons (Captain W. R. C. Leggatt), which has been here since September 15, is due to leave Marsaxlok harbour early to-morrow. The *Ocean* is homeward bound from the Far East station, and on her arrival is expected to be relegated to reserve, her crew being transferred to the Mediterranean-bound carrier H.M.S. *Glory*.

After undergoing engine trials outside Grand Harbour this morning the hospital

ship H.M.S. *Maine* left for her Far East station.

London *Times*, Sept. 26.—The visit to Turkey of an R.A.F. Vampire squadron has proved a great success. After visiting Eski Shehr, the squadron arrived at Istanbul, where President İnönü received in audience Air Marshal Sir William Dickson, Air Commander-in-Chief, Mediterranean and Middle East, and Air Commodore B. H. C. Russell, Commander, R.A.F. Cyprus, accompanied by the British Ambassador, Sir Noel Charles. This morning the Vampires performed demonstration flights over Istanbul and the Bosphorus, watched by President İnönü from the terrace of the Dolma Bagtché palace. The squadron will next visit Ankara and will return to Cyprus on Wednesday.

London *Times*, Sept. 29.—Malta.—H.M.S. *Unicorn*, the 14,750-ton aircraft maintenance ship, arrived here to-day on a three-day halt before continuing her voyage to the Far East. After taking on aircraft and aero engines, the *Unicorn* will leave for the Far East on Saturday, carrying naval personnel from Halfar who are to serve on the Far East station.

Australian-New Zealand Naval Exercises

London *Times*, Oct. 4.—Melbourne.—The cruiser *Bellona* and five trigates of the New Zealand Squadron, under the command of Captain D. Hammersley Johnston, R.N., have arrived at Sydney to take part in exercises with the Australian fleet. The first of the series will be held from October 7 to 15 off Jervis Bay.

The New Zealand Squadron will remain in Australian waters until November 19 and will visit Melbourne and Hobart.

FRANCE

Comment on Combined Fleet Exercises

Revue de Défense Nationale, Aug.-Sept., 1949.—The tactical and technical lessons of the recent exercise *Verity*, conducted by the allied armada under Admiral McGrigor, are naturally in the category of secret information. It is nevertheless possible, thanks to the official communiqués and a certain

number of eye witnesses (those, in particular, that Rear-Admiral Barjot and Commander Traub of the *Arromanches* placed at the disposition of the *Revue*) to derive from operation *Verity* a number of lessons of general import.

The results appear to have been most satisfactory. Not only the French command, but Admiral McGrigor and Rear Admiral Mansergh, commanding the British aircraft carriers, expressed gratification with the exercise. Despite the diversity of languages and procedures, despite the fact that each group of ships comprised units of different nations, and that the command passed during the course of operations from British authority to French authority, and although, finally, the command ashore was shared, for instance, between Admiral Robert at Brest (aerial explorations, P.T. boat attacks, etc. . . .) and Admiral Willis at Portsmouth (defense of landing points on the Channel), the cohesion between the allied forces appears to have realized the most optimistic hopes.

In the area of tactic and technique, exercise *Verity* confirmed the seriousness of the danger represented by the modern submarine (rapid, and capable of sustained navigation submerged) for maritime communications, and the preeminence of the aircraft carrier in protective operations. This does not mean that shore-based planes, search or fighter *Meteor* planes, did not render outstanding service (e.g. the *Fighter Command* of the R.A.F. in the narrow corridor of the Channel). But embarked aviation played a preponderant rôle, thanks to the permansive support afforded a convoy as well as the instantaneousness of its reactions, informations, or interception. The British Admiralty appreciated this so well that Admiral McGrigor, Commander-in-Chief, had hoisted his flag aboard the combat carrier *Implacable*.

In this connection, it is appropriate to underline the operations of the anti-submarine hunter group directed aboard the carrier *Arromanches* by Rear Admiral Barjot. The aviation and destroyers of this formation, working in close liaison at a rather advanced position in the fore of the convoy, constituted as it were an 'information-execu-

tion bloc,' capable of attacking the submarine immediately after detection and well before it could penetrate into the waters of the convoy. The French pilots of the *Arromanches* acquitted themselves all the more remarkably in their missions (26 sorties and 30 carrier landings) since they had abandoned their over-age *S.B.D.*'s on the eve of the exercise and had had only seven hours flying time in the *Seafire* planes which the British Navy had just given us in their stead.

Whether the necessary funds for the *Clemenceau* are granted by the next budget or whether we are to get along temporarily with an existing carrier loaned from the outside, the exercise *Verity* has indicated that we could hardly get along without a greater number of vessels of this type.

EDITOR'S NOTES: See Notes in October PROCEEDINGS.

U.S.S.R.

Escorts Returned to U. S. in Japan

New York Times, Oct. 19.—Yokosuka.—Russian sailors hid their faces from American cameramen and a Soviet captain overruled a United States Rear Admiral today as nine destroyer escorts given to the Soviet Union under lend-lease in 1945 were returned to the American flag at the naval base here in an atmosphere of Iron Curtain comedy.

The ships, all of which are of 1,400 tons, mounting three-inch guns, were turned over by the Russians after a brief ceremony on the quarterdeck of the destroyer escort *Tacoma*. But although Allied correspondents had been invited aboard by Rear Admiral Benton W. Decker, the United States Navy's representative, they were brusquely shooed away from the gangway by Soviet guards.

It was explained that Captain Korovkin, Russian flotilla commander who did not offer to give his first name to the United States representatives, felt the *Tacoma* would be "too crowded" if half a dozen American newspapermen came aboard. The United States Navy then obligingly rolled up a huge traveling crane that towered over the *Tacoma's* decks as the destroyers lay at her wharf and from the crane's girders Allied newsmen watched the ceremony.

FIRST OF 27 TO BE RETURNED

The vessels are the first of twenty-seven destroyer escorts that the Russians are scheduled to return here and besides the *Tacoma* they include the *Charlottesville*, *Long Beach*, *San Pedro*, *Coronado*, *Ogden*, *Allentown*, *Machias* and *Sandusky*. They arrived on Oct. 14 with a complement of 520 seamen and about fifty officers.

Although the Russian sailors had been offered the freedom of the United States base, including automobile transportation, moving pictures, service club facilities and even free beer, not one seaman had set foot ashore until today with the exception of a pair who daily emptied Russian garbage buckets from the end of the wharf.

A half dozen officers did attend the official reception given by Admiral Decker for Allied visitors. The lesser ranks, according to a Russian-speaking yard attaché who managed to chat with Soviet sailors across their bulwarks, had been informed that the Americans would not permit them to land in case "they should see what there is to see at this base."

Today's ceremonies, as far as the cranes-eye witnesses were able to observe, consisted of an exchange of ships' papers between Admiral Decker and Captain Korovkin. Then the Soviet naval flag, the hammer and sickle and star, was lowered from the *Tacoma's* stern and the United States emblem was hoisted while the naval band played the Soviet national anthem and the Star Spangled Banner.

OBJECTED TO CEREMONIES

Russian seamen aboard ducked as movie-men on the pier sought to get pictures. Navy officers said the Russians at first objected to any ceremonies at all, apparently intending to keep the transfer as secret as possible, then objected to the presence of what they called a "jazz orchestra." The objection was withdrawn when Admiral Decker assured them music would be played by the official Naval band.

At the end of the ceremonies the Russian sailors filed down the gangplank without the customary salute to the United States flag at the stern. Mustered on the wharf, they

stayed ashore less than ten minutes before boarding a United States landing craft that took them to the Soviet freighter *Tohol*, in which they will return to Vladivostok.

Admiral Decker told correspondents he had no orders regarding the disposition to be made of the nine ships. He said he had received them "in very good condition by Russian standards."

United States sailors who boarded the ships as guards after the Russians evacuated them told a different story.

Rocket Output

Chicago *Tribune*, Sept. 27.—Berlin.—German scientists are producing for Russia transocean rockets they designed for Hitler just before the war ended, soviet zone informants claimed today.

The informants, who have access to offices of the soviet backed east German police, said the mammoth underground munitions plant at Peenemuende on the Baltic coast is turning out rockets at full speed.

Allied intelligence officers said they know of "certain activity" at Peenemuende but declined to elaborate. One of them explained: "If Russia is making munitions in Germany it's a high level matter and not for discussion here."

NAMED "FIRE LILY"

At the end of the war the victorious allies agreed that Germany's war potential should be destroyed.

The new rocket, said the German informants, was dubbed "Fire Lily" by the Nazis who never had a chance to use it. The name comes from the way the rocket blossoms into eight to 10 separate aerial bombs when it arrives over the target, scattering destruction over a three square mile area. Its range and accuracy are enough, the report said, to hit a target 5,000 miles away.

Allied and German sources confirmed that Russia had installed a chain of rocket launching platforms in eastern Europe, stretching all the way from the Baltic to the Black sea.

Peenemuende was wrecked by allied bombers during the war, and then rebuilt by Russia, with labor from the war prisoner

camp at Blagovostroi in the Ural mountains, the informants said. Russian technicians supervised the installation of machinery, but Germans who built the rockets for Hitler's war machine are said to be in charge of rocket production begun early this year.

MATERIAL SENT FROM RUSSIA

Material for research and testing is sent to Peenemuende from the aeronautical institute of Voroshilovgrad and from a Moscow institute. Production of "Fire Lilies" is carried out in the vast underground caverns which the Nazis fitted out for rocket and torpedo plants and testing grounds, the sources said.

The informants said the entire population of Peenemuende was evacuated when the Russians began rebuilding the rocket plant. The installation now is guarded by a barricade of high voltage wires and mine fields and is patrolled by 3,500 members of the soviet MVD [security] police, who live in former German army barracks at Topposch.

Two flotillas of speedboats are used to guard the seaward approaches, and all supplies for the plant and workers are delivered by sea for security reasons.

Another German informant said the Russians are turning out powerful, long range rockets at Rechlin, site of a big underground munitions factory built by the Nazis.

These reports coincide with disclosures by allied sources that Russia has studded eastern Europe with rocket launching bases. These persons added they did not believe that similar bases were being readied in the soviet zone of Germany.

Escapee's Story of Atom Test

New York *Herald Tribune*, Oct. 14.—*The following dispatch on Soviet atomic development is based on information obtained by Yves Delbars, correspondent for the Paris weekly "Samedi Soir." On July 30 he reported that Russia had acquired the atomic bomb. His source of information was an escaped Soviet officer.*

Paris.—The first atomic explosion in Russia occurred in the Ust Urt desert, east of the Caspian Sea, on July 10, with Prime Minister Stalin an eyewitness, and Russia does not yet have a stockpile of atomic bombs, Major Boris Silov, former Soviet

Army officer, declared recently before sailing for South America.

It was Major Silov who said last July that Russia had the atomic bomb, a statement which was published in the July 30 issue of *Samedi Soir*. He and two Russian companions had left Eastern Germany in June after deciding to join his relatives in South America.

Major Silov stated at an interview in Antwerp prior to his sailing that the first explosion took place on July 10 in the southeastern extremity of the Ust Urt desert, east of the Caspian Sea in the Kazak and Usbek Soviet Republics, where there exists a "zapovednik" (forbidden reservation) of some 23,000 square miles.

He said Mr. Stalin insisted on being present at the explosion in spite of the long railroad trip. Several members of the Politburo also were present, notably L. P. Beria, Marshal K. E. Voroshilov, A. I. Mikoyan and Marshal Nikolai Bulganin.

The experiment was directed by Professor Abram F. Joffe, vice-president of the Atomic Research Commission, assisted by a number of Russian and German scientists.

Major Silov said there is no stockpile of atomic bombs in the Soviet Union because mass manufacture could not be undertaken before the perfection of a prototype. Such manufacturing could start only after the experiments in July.

Major Silov ventured the opinion that Russia should not be able to produce annually more than twenty to thirty "normal" atomic bombs (uranium plus plutonium) because of technical and industrial limitations. He said that production of the much less powerful thorium plus brevim bombs could reach a total of one hundred and fifty bombs annually.

Three groups of atomic piles are located in Siberia, the Major said, and special workshops for manufacture of the bomb itself, as well as a center for final mounting, are installed at Sterlitamak, on the European side of the Ural Mountains, and on the outskirts of the Ust Urt desert.

STALIN ENTHUSIASTIC

Although Mr. Stalin, in his capacity as president of the Atomic Research Commis-

sion, is the nominal atomic boss in Russia, the program is actually directed by his two assistants, Mr. Beria and Professor Joffe, Major Silov said.

However, he added, Mr. Stalin is hypnotized by the atomic question, and continually reads brochures, in popular language prepared specially for him, on nuclear energy. He sends for specialists, asks for detailed reports on the progress of the work, and reacts violently to setbacks. This was the reason for the semidisgrace of Dr. Peter Kapitza after the 1947 failures.

OTHER COUNTRIES

India

London *Times*, Sept. 10.—Plymouth.—The destroyer *Raider*, 1,705 tons, was handed over to the Government of India by the Commander-in-Chief, Plymouth, Admiral Sir Robert Burnett, at Devonport Dockyard today. It was accepted by the High Commissioner for India Mr. V. K. Krishna Menon, and renamed H.M.I.S. *Rana* by Lady Burnett.

The destroyer, which was commissioned in 1942, primarily for anti-submarine and convoy duties, has been given an extensive refit during which all her armament and other equipment has been brought up to date. She took part in the assault on Sicily in July, 1943, and in patrols and bombardments in support of the Eighth Army. Later she joined the Eastern Fleet.

The destroyer, which is commanded by Commander S. N. Kohli, now joins the 11th Destroyer Flotilla under the Command of Captain A. Chakravarti, Royal Indian Navy, at Gibraltar.

Italy

London *Times*, Sept. 28.—Rome.—A naval building programme estimated to cost 50 milliard lire (about £20m.) is to be carried out by Italy between 1950 and 1955, Signor Pacciardi, the Minister of Defence, announced in the Italian Chamber of Deputies to-night.

The programme includes the reconstruction of two cruisers, the *Luigi di Savoia* and the *Duca degli Abruzzi*, and the building of two light anti-aircraft ships, six destroyers

specially adapted for defence against aircraft and submarines, one convoy escort, fast motor-gunboats, and lagoon and coastal vessels for supporting an army holding a sea front.

The total of the projected new tonnage was not indicated, but the programme must necessarily be a modest one. Italy must keep within what commentators here term the "narrow and unjust limits" of the peace treaty, under which she pledged herself not to lay down any war vessels before January 1, 1950, and her total tonnage was limited to 67,500 tons, while the construction of aircraft carriers, submarines, motor torpedo boats, and assault craft was prohibited. It is pointed out that Italy, being unable to build submarines and assault craft, has concentrated on light surface vessels suitable to the Mediterranean but not for action in oceanic waters.

Signor Pacciardi also said that Italy was negotiating the purchase of jet fighters, and that by the end of the year she would possess modern machines. To-day the Italian Air Force was 10 years behind the times and its old machines must be changed.

The Government intended to raise the army to 250,000 men—troops and carabinieri—which was the limit allowed by the peace treaty. Infantry divisions would be increased from eight to 12, some of which would be armoured.

Japan

New York *Times*, Oct. 15.—Tokyo.—Armed Russian patrol vessels have been raiding across "the MacArthur line" to seize Japanese fishing boats operating in coastal waters, it was charged today by Japanese fishermen returning from northern fishing fields.

Almost fifty Japanese craft, mostly small Diesel-powered ships of less than fifty tons, have been taken by the Russians since last month, according to official figures, and more than a score, with crews of about 1,000 men, still are detained.

Returning fishermen have told their stories to the heads of district fishing associations and as a result, a petition has been drafted asking General MacArthur to negotiate with the Soviet Union for the return of the ships

and men. This was signed by Matsuzo Hirano, head of the fisheries association of Shirahama in Chiba Prefecture from which some of the boats had sailed, as well as by officials of fifteen other fisheries associations and cooperatives.

The subject reached the Cabinet level today when the Transport Minister, Shinzo Oya, told his colleagues the Government also had asked Allied Headquarters to seek the return of ships and men from Russia.

According to the Minister's figures, a total of forty-three Japanese fishing vessels are known to have been seized or to have disappeared in northern waters since Aug. 12. Fifteen have been returned and twenty-eight still are held, he said.

Mr. Hirano declared returning fishermen had informed him that, while some ships might have been seized after having strayed into Soviet waters, on several occasions Russian patrol boats raided right up to the Japanese coastline.

The fishing vessels involved were those seeking "sunma," a form of herring sometimes known as "the hairtail," and were operating at night, attracting the fish with lights according to the usual practice.

On more than one occasion, Mr. Hirano said, the fishermen reported that Russian patrol boats had crept up to the Japanese fishing fleet in the darkness, suddenly switched on searchlights, ordered the Japanese to follow them into Soviet waters where the fishing vessels were seized.

According to this account, older, less desirable Japanese boats then were ordered by the Soviet patrol to return. The faster, more modern vessels were escorted to harbors in the Kurile Islands, where, Mr. Hirano said, the Japanese feared they would be taken over by the Russians for the Soviet fishing industry with Japanese crews ordered to operate them under Russian orders.

According to Mr. Hirano's figures, which differ slightly from Mr. Oya's, twenty-seven Japanese boats thus have been seized since Sept. 20, when the "sunma" season opened. Apparently no accurate figures exist on the total number of Japanese vessels seized by the Russians since "the MacArthur line" was laid down in 1945 in the narrow waters between Hokkaido and the Kuriles. It is

known, however, that Soviet patrol boats in this area carry light guns and on at least one occasion are reported to have opened fire on Japanese fishermen.

AVIATION

P2V Flies 4,863 Miles from Carrier

New York *Herald Tribune*, Oct. 7.—San Diego.—A Navy Neptune patrol bomber capable of carrying the atomic bomb landed at the Naval Air Station here today after a 4,863-mile non-stop flight from the aircraft carrier *Midway* in the Atlantic.

The flight was described by the Navy as the longest ever made after launching from a carrier. The twin-engined bomber was in the air twenty-five hours and forty-two minutes.

Commander Frederick L. Ashworth, executive officer of Composite Squadron 5, Moffett Field, Calif., was pilot. The plane carried a seven-man crew. After refueling here, the Neptune took off for Moffett Field, its home base.

The epochal flight was made from *Midway*, off Norfolk, Va., across the Caribbean to the Panama Canal, back northwest across the tip of the Yucatan Peninsula, and over San Antonio and El Paso, Tex., Tucson and Yuma, Ariz.

EDITOR'S NOTE: See Notes in June PROCEEDINGS.

D-558-2 Makes New Record

Aviation Week, Oct. 3.—Douglas D-558-II Skyrocket has attained the speed of sound in level flight.

The glistening white Navy research aircraft reached Mach 1.03 at an altitude of 26,000 ft. (approximately 710 mph.) in a mid-July test flight at Muroc Air Force Base, Calif. Veteran Douglas test pilot Gene May was at the controls.

Unlike the Air Force's Bell X-1, which literally blasted its way through increasing drag to achieve supersonic speed, the Skyrocket performance was obtained in a smooth, normal flight, well within the plane's aerodynamic capabilities.

Fastest in World—Thus, the Navy-Air Force competition becomes keener, with the Navy finding itself with the fastest airplane in the world. Before this, the Air Force had it.

The Skyrocket has a design capability of 1820 mph. at 75,000 ft. Such performance, if attained, not only would establish a speed record, but also an altitude record. (Maximum design speed of X-1 is 1000 mph. at 60,000 ft.)

The North American F-86 Sabre has gone 710 mph. in level flight at sea level, but at this low altitude such speed is about 50 mph. below that of sound. The F-86 also is intended for supersonic flight above 40,000 ft., but not to the limits for which the Skyrocket is designed.

Not First Time—The July flight was not the first supersonic performance of the Skyrocket. It has frequently reached supersonic speed in shallow dives, but this was its first level-flight breach of the sonic barrier. The flight itself was largely the result of enthusiasm on the part of test pilot May, since contract specification requires a demonstration of the airplane by Douglas Aircraft Co. personnel only up to Mach 0.95.

The successful supersonic flight was somewhat belated, and came after a series of powerplant difficulties had plagued the craft. Major problem in early test flights was created by the craft's extremely short endurance, which has fallen much below expectations.

Short of Fuel—Its Westinghouse J-34 turbojet engine is provided with a fuel supply of 250 gal. of ordinary aviation gasoline, sufficient for an endurance of only about 30 min. The Reaction Motors four-barrelled rocket engine, while of identical design to that used in the historic Bell X-1, is provided with only 3000 lb. of propellant, little more than a third the amount carried by the X-1.

For this reason, actual altitude time of the Skyrocket is only 12 min., of which less than 1 min. is available on full rocket power. Total rocket time can be extended to about $3\frac{1}{2}$ min. by firing the chambers in sequence.

Skyrocket Sequel

Aviation Week, Oct. 10.—Although Navy by midweek had not officially confirmed the exclusive and authoritative *Aviation Week* story of Oct. 3 that the Douglas D-558-II Skyrocket had flown faster than sound, plans for an elaborate Navy press and newsreel junket to Muroc Air Force Base to see the

plane establish a new world speed record were temporarily postponed by the story. Navy plans for the event are uncertain at the moment.

More Air Transport for Sick

New York *Herald Tribune*, Oct. 5.—Washington.—Faster transportation for the medical patients of the armed services to increase their morale and conserve the time of scarce doctors and nurses was announced today by Secretary of Defense Louis Johnson.

Hereafter, he said, the Military Air Transport Service will take over transportation of all such patients throughout the world. Heretofore, most of them have been carried on slower hospital ships and trains.

The switch to air transportation, a step in the consolidation of medical facilities of the armed services, he said, was ordered on recommendation of the Joint Chiefs of Staff, Defense Director of Medical Services and the Surgeons General of the Army, Navy and Air Force.

Mars Return to Service

New York *Times*, Oct. 11.—Alameda.—Five huge Mars flying boats, ordered out of the air for engineering inspection, have been put back into Military Air Transport Service in the Pacific, the Navy said last night.

The four-engine Marshall, Philippines, Marianas, Hawaii and Caroline Mars were taken off their runs between the Pacific Coast and Hawaii last Monday.

The Philippines Mars dropped an engine on a flight to Hawaii Sept. 6 but came in for a safe landing. After studying the plane, a Navy spokesman at Pearl Harbor said Thursday: "It was concluded that something possibly was structurally wrong with the propellers."

The Navy last night said the five craft received a thorough engineering inspection at the naval air station here and were released for flight by the commander of operations. The Mars squadron operates as fleet logistics support.

New Anti-Submarine Aircraft

London *Times*, Sept. 27.—Limited details are released to-day of two new anti-submarine aircraft, the Fairey 17, made by the

Fairey Aviation Company, and the Blackburn Y.A.5, made by Blackburn and General Aircraft. There is also news of a Ministry of Supply contract for prototypes of a new dual-control basic trainer for the R.A.F.

The Fairey 17 is particularly interesting, for it is the first aircraft, either military or civil to make use of a paired airscrew turbine. It is fitted with an Armstrong-Siddeley Double Mamba, which gives 2,540 h.p. plus 770 lb. of thrust for take-off, and has a maximum combat power of 3,500 h.p. plus 280 lb. of thrust at 400 miles an hour. The engine consists of two single Mamba units laid side by side with their individual reduction gears replaced by gearing in a common casing, arranged to drive two co-axially mounted, but independent airscrews rotating in opposite directions. The Mamba is an axial flow type of gas turbine.

The Blackburn Y.A.5 is fitted with a Rolls Royce Griffon piston engine, a more powerful engine than the famous Merlin, which powered the Battle of Britain Hurricanes and Spitfires.

The R.A.F. trainer prototype contract has been awarded to Handley Page (Reading). The aircraft is a low-wing monoplane of all-metal construction with side-by-side seating for pupil and instructor, and is at present known only as the H.P.R. 2. It is powered by an Armstrong-Siddeley Cheetah 17 piston engine.

Many Nations in Air Exercise Over Britain

The *Aeroplane*, Sept. 30.—Exercise "Bulldog," held over a period from September 23 until September 27, was organized with the primary object of applying our air striking force in attacks against a highly organized defence system. Unlike Exercise "Foil," the recent fighter manoeuvres, "Bulldog" had a bomber bias and the attacking aircraft did not offer themselves for interception on specified routes. On the contrary, they used all the legitimate means for evading the defences, so that, operationally, the exercise was more realistic than usual.

Nevertheless, there was no competition between the opposing sides, and the exercise was used purely for gaining the utmost experience in modern tactics by the attacking

R.A.F. and U.S.A.F. units and the defending R.A.F., French, Netherlands and Belgian forces disposed in Great Britain. Air Marshal Sir Basil Embry, C.-in-C., Fighter Command, took the opportunity to try out some new ideas in the control and reporting system, which, in one sector, was almost entirely manned by personnel of the Fighter Control units of the R.Aux.A.F.

Fighter Command forces included, for the first time, Vampires of the French Air Force and Meteors of the Belgian Air Force, while Meteors from the Netherlands again worked with the R.A.F. No higher praise could be offered than to say that these units of Western Union Air Forces worked with our crews as if they were in the same service. In the fighter network, A.A. Command, under Lt.-General Sir Ivor Thomas, deployed about 5,000 Regular and T.A. personnel in their fourth exercise during the past 12 months. The defences were assumed to be concentrated around the most important targets, including London, Portsmouth and Bristol.

In overall command of the exercise, Air Marshal Sir Aubrey Ellwood, C.-in-C. Bomber Command, directed the offensive force, comprising R.A.F. Lincolns and Lancasters, Mosquitos from B.A.F.O. and B-50's of the Third Air Division, U.S.A.F. This was the first time that B-50's had taken part in a British exercise, and they used to full advantage their superior speed, range and operating ceiling over the B-29's. Operating both by day and night, they set an interception problem sufficiently formidable to keep any fighter defence system on its toes and provided some of the finest targets in the exercise.

Even the B-50, however, does not bridge the gap between the present equipment of Bomber Command and such new bombing jet-aircraft, of which the Canberra is only the beginning. To simulate jet-bombers in "Bulldog," Meteor 4's from Horsham St. Faith were used, in close approximation of future operating heights and speeds of strategic aircraft. Our defence system acquitted itself well against these realistic attacks.

No real assessment of the two days' operations by the jet fighters of four nations is possible, but visitors to these two stations could not fail to be impressed by the high

standard of the handling of the aircraft, the keenness and the good spirit of pilots, ground crews and staff officers on the job, and the good co-operation of the stations used as bases.

Despite the fact that the weather during the opening phases of the exercise prohibited operations until the morning of September 24 the extension of a day on the period of activity, coupled with a great deal of hard work by all, enabled the maximum benefit to be obtained from "Bulldog." The increasing extent of successful military co-operation between Western Union countries and the United States is most heartening.

New Russian Airliner

Manchester *Guardian*, Sept. 13.—Czechoslovakian Airlines brought one of the latest Russian air-liners to Northolt aerodrome yesterday and permitted a few British aviation specialists to examine it and to go for a short flight.

The aircraft is the Il. 12, to the design of Ilyishin. It is a 32-seater with an all-up weight of about 38,000 lb. and it has two Russian Ash engines each of 1,500 h.p. They are air-cooled radials. The aircraft has a tricycle undercarriage and is modern in appearance and its performance seems good. We were able to cruise at over 320 kilometres an hour and the climb appeared to be quick.

The interior is furnished in a somewhat austere manner, but the seats are comfortable and the cabin ventilation seems good. The arrangement of the seating can be varied by means of a movable bulkhead.

MERCHANT MARINE

Soviet Merchant Marine

Revista Marittima, July 1949.—The data are incomplete and fragmentary on the Soviet Merchant Marine. According to an Italian evaluation based on pre-war figures and from which it has not been possible to deduce exact wartime losses, the Soviet Merchant Marine in 1947 counted 2,157,000 tons of ships. However, in 1948, a London agency quoted a figure of 417 units (excluding those adapted for internal traffic) with 1,300,000 tons D.W. which had passed by the end of the year, according to another English

figure, to a total tonnage of 1,405,678. Of this tonnage, 13 units, or 92,974 tons, are probably motor tankers.

The organization of the Soviet Merchant Marine derives from the State, the direct proprietor of the entire maritime establishment. Hence, in the Soviet Union, there are no freight markets and no competition between navigation companies; likewise, missing is the publication of market quotations and news of agencies.

In the Soviet press there is no news on shipping, trade, or insurance. The principal Soviet journal on the Merchant Marine is the bi-weekly *Morskoi Flot*, published in Moscow by the Ministry of Merchant Marine, but this journal treats maritime problems only insofar as they refer to hours of work, incentives to inter-crew competition, and the fulfillment of the Five-Year-Plan.

Soviet maritime transports are organized as a function of the three principal maritime districts of the Black Sea (with shipping center at Odessa), and of the Northern Seas (centers at Leningrad, etc.). The merchant fleet of the Black Sea makes up 65% of the overall sea-going tonnage of the U.S.S.R. Maritime service with foreign countries is not highly developed, since this is often leased to foreign companies. Among the most important lines are: Leningrad-London; Odessa-Italian ports-Marseilles; Odessa-Durazzo-Costanza-Ports of the Levant; Braila-Ports of the Indian Ocean. Some services out of the Black Sea are provided by Italian ships which in 1948 maintained lines between Poti, Novorossisk, Odessa, and the Mediterranean ports.

Western merchant marines play an insignificant rôle in the handling of Soviet petroleum. In the main this traffic is domestic and is handled by Soviet carriers.

At present Russia controls the major part of Danubian traffic. Fifty-one per cent of the Roman *Sovrom-Transport*, of the *Bulgarski-Morskoi Flot*, and of the fluvial companies of the Danube are in Soviet hands. As reinforcements for the present Danubian fleet 400 new units are under construction at yards in the Black Sea.

EDITOR'S NOTE: See Notes in November PROCEEDINGS.

Ship Race

The *Shipbuilder*, Aug. 1949.—Newport News Shipbuilding Co., Va.—An article in a recent issue of the *Boca Grande Journal* related a story of the *James Elwood Jones* and the *Mae* in a race between these ships for port. The story held our interest because the *Jones* of the Pocahontas Steamship Company has been a frequent visitor to our Yard, and the *Mae* was in our plant during July for voyage repairs and special work.

The unrelated portion of the story contains two items which probably contributed to the performance of the *James Elwood Jones*; they are the streamlined rudder and rudder post and the new airfoil propeller installed at our plant. The ironical portion of the tale is the fact that the Bull Steamship Company sold the *James Elwood Jones* to the Pocahontas Steamship Company because of her slow speed.

On Monday night, April 25, 1949, the *Mae*, with Captain Bob Hudgins in command, was due to arrive at the sea buoy in Boca Grande Harbor, Florida, at 9:30 P.M. The *James Elwood Jones*, with Captain White in command, was due to arrive one-half hour later. The Seaboard elevator in the harbor was all geared to run the 10,500 tons of phosphate rock into the *Mae* at record speed. Both ships were coming up from Rebecca Shoals, when a heavy northeaster started blowing at about thirty-five miles per hour, almost a head wind.

Captain White of the *James Elwood Jones*, which has had many improvements and renewals in our plant, knew that the *Mae* was ahead and was trying to make the berth. Captain White called the engineer and told him that they were going to try to beat the *Mae* to the berth. No further urging was needed, as nothing makes an engineer happier than to be challenged to race for a berth. What happened in the engine room of the *Jones* that night is not known, but if it had been on the Mississippi River in the old days, we probably would have said there was "a colored fireman asitting on the safety valve, and the furnace crammed with rosin and pine."

Captain Hudgins, on the *Mae*, had

pumped out all of his water ballast and was drawing only fourteen and one-half feet of water with the big Liberty hull, and the head wind was more than she could handle. The *Jones*, drawing seventeen feet of water, easily passed the *Mae* and arrived fifteen minutes ahead of time; the *Mae* was an hour and a half late. The *Jones* was berthed and loading when the *Mae* came to anchor in the stream to lose sixteen and one-half hours port time.

The airfoil propeller for the *James Elwood Jones* was designed in accordance with the best information available from the Taylor Model Basin and from foreign model basins on the most efficient type of airfoil sections. In determining the shape and width of the propeller blades we were guided by our experience in fitting new propellers on other cargo vessels which do not have their propellers completely submerged in the ballast condition. On such vessels, when the blade area was increased over that of the original propeller, the improvement in speed has been particularly noticeable in the ballast condition owing to the added efficiency resulting from reduced slip.

At the same time the improved propeller was fitted, the rudder was changed to a stream-lined rudder of Newport News design in order to eliminate the drag previously caused by the square rudder post and circular rudder stock. The rudder post was shrouded by a streamlined steel plate from top to bottom, with a fairwater in way of the propeller hub. The existing rudder stock and single-plate rudder were left in place and completely surrounded by a symmetrical streamlined steel plate structure of carefully designed contour attached to and supported by the original rudder. The arrangement was approved by Lloyds.

It was estimated that the combination of improved propeller and streamlined rudder added one to one and a half knots to the vessel's speed with no increase in power.

INTERNATIONAL

Exercise "Agility"

Manchester *Guardian*, Oct. 15.—Combined exercises in which the British Army

of the Rhine, British Air Forces of Occupation, and units of the Belgian, United States, French, and Norwegian armies will take part, are to be held in the Paderborn area of Westphalia from October 9 to 14, the War Office announced last night.

The exercises are to be divided into two parts to be known as "Agility 1" and "Agility 2." The War Minister, Mr. Shinwell, is expected to take the salute at a march-past and many high-ranking civilians and officers of the British and Allied Services have been invited to attend Exercise "Agility 2." The formations taking part will parade on October 8, the day before the exercises begin, to enable spectators to study their composition, weapons, and equipment.

The object of "Agility 2" is to give commanders, staffs, and all officers and other ranks of the British Army of the Rhine experience of their rôle in a large formation under conditions similar to war.

SCIENCE

New Radiation Detector

New York *Herald Tribune*, Oct. 8.—"Radiac sets," a new type of radiation detecting and measuring device suitable for both military and civilian defense use, are now in production, the Army announced tonight.

The Navy, the Air Force and the Atomic Energy Commission are developing other radiation detection instruments to fill their specific needs under a co-ordinated program directed by the armed forces special weapons project.

Deliberately made less sensitive than the Geiger counter, the radiac set is for detection and measurement of relatively large concentrations of radiation beyond capabilities of the Geiger counter, "such as would result from an atomic bomb blast," the Army said. Its immediate use is primarily for training troops as radiation survey teams which would, in the event of an atom blast, go over the blasted area to determine when and where it would be safe for human beings to venture and how long they could remain safely.

Designed for possible combat use, the set

uses standardized parts to stand up under shock and vibration and can easily be repaired in the field. It is small, only ten and a half inches long in its greatest dimension, and weighs only ten pounds.

"Within the steel case of the new radiac set is a gas-filled chamber (the ionization chamber) which contains two electrodes. The electrodes carry positive and negative electrical potentials, respectively. When the instrument is carried into a 'hot' area, Gamma rays pierce the gas chamber's wall and dislodge electrons from gas atoms. The electrons, negatively charged, are attracted to the positive electrode in the ionization chamber. The atoms from which the electrons have been dislodged now are positive ions and are attracted to the negative electrode. A very weak current flows, is amplified by the electronic system in the radiac set, and is read off a meter."

Mapping Ocean Temperatures

New York *Times*, Oct. 2.—A project of plotting ocean temperatures that may go on for generations is being pursued by the Scripps Institution of Oceanography here.

Oceanographers have done a lot of charting and studying of static features of oceans, such as depth, terrain and major currents. But they admit to vast lack of knowledge of detailed matters—for instance, the interaction of ocean waters and the air above and periodic changes in temperature at different locations, depths and times. These are probably critical factors in phenomena, such as marine life.

The latter in turn is no longer simply of academic interest to people like zoologists and biologists. In the last few years it has been realized that oceans are probably a far more important future source of chemicals and food substances than the land masses.

To fill in the extensive void in knowledge about ocean temperatures, the Scripps Institution, a branch of the University of California at Los Angeles, has expanded rudimentary wartime observations made for the Navy into a large-scale project of plotting heat variations throughout the Pacific and Indian Oceans.



Photograph Courtesy of Grace Line

RADAR ON AN AMERICAN LINER

This Sperry Marine Radar installed on the liner *Santa Paula* facilitates harbor navigation and serves as an anti-collision device at sea.



Changes in the Board of Control

At the last meeting of the Board of Control, Rear Admiral John W. Roper tendered his resignation as a member of the Board due to the consuming nature of his new duties as Chief of the Bureau of Naval Personnel. The Board accepted his resignation with regret, and appointed Captain Robert H. Rice, U. S. Navy, Head of the Department of English, History, and Government at the Naval Academy, to serve on the Board in his place.

Naval Institute Calendars

If you have not ordered your Naval Institute Calendar for 1950 . . . or your refill calendar pad and memo pad if you still have your previous calendar cover . . . you should send in your order now to be sure of receiving calendars or pads before Christmas. The price of complete cover, calendar pad, and memo pad is only \$1.00 postpaid to Institute members, and \$1.50 to non-members. Price of 1950 calendar pad refill is 25 cents and of memo pad refill is 15 cents. You will find that these calendars will be more appreciated than other articles you might give at several times the price. Appropriate for all sexes, ages, and conditions of relationship, these calendars are the ideal "last-minute" thoughtful gift.

Special Enlisted Prize Essay Awards

Next month's PROCEEDINGS will announce the winners of the 1949 Special Enlisted Prize Essay Contest, and will publish the winning essay in the same issue.

Radar on American Merchant Ships

A recent report from the National Federation of American Shipping reveals that U.S. shipping has spent between \$5,000,000 and \$6,000,000 for radar installations since the end of the war. A total of 453 oceangoing U.S. merchant ships have been equipped with radar. On the 87 ships so equipped within the last 12 months, the average radar installation cost \$12,000. It was stated that the number of installations would have been even greater had it not been for the proposed adoption by the Federal Communications Commission of radar operator regulations which, in the shipping industry's opinion, would limit the jurisdiction of the ship's Master and prevent full use of radar as a valuable navigation aid.

No More Three-Year Hitches

As of this fall, the Navy has discontinued the three-year enlistment period and has reverted to the former peacetime enlistments for four or six years. The shorter enlistment periods were found to result in too rapid turnover of enlisted personnel for best efficiency and stability.

Dues and Subscriptions

Readers are reminded that beginning January 1, 1950, annual membership dues in the U. S. Naval Institute will be \$3.00 per year (including full year's subscription to the PROCEEDINGS); subscription to the PROCEEDINGS for non-members will be \$5.00 per year (foreign postage, \$1.00 additional).

Special Notice

U. S. Naval Institute General Prize Essay Contest, 1950

A PRIZE OF NOT LESS THAN \$500 and of not more than \$1,500, a gold medal, and a life membership in the Institute will be awarded for the best essay submitted on any subject pertaining to the naval profession, should the Board of Control consider the essay to be of sufficient merit. Should the prize be awarded to a previous winner, a gold clasp suitably engraved will be given in lieu of the medal and the commuted value of the life membership in lieu of the life membership.

Irrespective of the award of the "Prize," one or more essays may receive "Honorable Mention," if of sufficient merit to justify the award. Essays awarded "Honorable Mention" shall receive such compensation as may be adjudged by the Board of Control, but not including a life membership.

In the event that no essay is adjudged of sufficient merit to receive the "Prize" or an "Honorable Mention," the best essay submitted may receive a special award in lieu thereof.

The following rules will govern this competition:

- (1) Essays should not exceed 8,000 words.
- (2) Essays must be received by the Secretary-Treasurer on or before January 1, 1950.
- (3) The name of the competitor shall not appear on the essay, and each essay must have a motto in addition to the title. This motto shall appear (a) on the title page of the essay, (b) on the outside of a sealed envelope containing identification of the competitor, (c) above the name and address of the competitor inside the envelope containing this identification. This envelope will not be opened until the Board has made the awards. Essays and identifying envelope must be mailed in a large sealed envelope marked "General Prize Essay Contest."
- (4) The awards will be made by the Board of Control, voting by ballot and without knowledge of the names of the competitors.
- (5) The awards will be made known and presented to the successful competitors as soon as practicable after the February meeting of the Board.
- (6) All essays must be typewritten, double spaced, on paper 8½" x 11", and must be submitted in triplicate, each copy complete in itself.
- (7) Essays awarded the "Prize," "Honorable Mention," or "Special Award" are for publication in the Naval Institute PROCEEDINGS. Essays not awarded a prize may be published at the discretion of the Board of Control, and the writers of such essays shall be compensated at the rate established for articles not submitted in competition.
- (8) Attention of contestants is called to the fact that an essay should be analytical or interpretive and not merely an exposition or personal narrative.

William G. Cooper,
Captain, U. S. Navy, Secretary-Treasurer

Vol. 75

JULY, 1949

No. 7

UNITED STATES NAVAL INSTITUTE

PROCEEDINGS





BETHLEHEM STEEL COMPANY

Shipbuilding Division

SHIPBUILDERS • SHIP REPAIRERS

Naval Architects and Marine Engineers

Manufacturers of Marine Machinery and

Miscellaneous Products

SHIPBUILDING YARDS

QUINCY YARD

Quincy, Mass.

STATEN ISLAND YARD

Staten Island, N. Y.

**BETHLEHEM-SPARROWS POINT
SHIPYARD, INC.**

Sparrows Point, Md.

BEAUMONT YARD

Beaumont, Texas

SAN FRANCISCO YARD

San Francisco, Calif.

SAN PEDRO YARD

Terminal Island, Calif.

SHIP REPAIR YARDS

BOSTON HARBOR

Atlantic Yard

Simpson Yard

NEW YORK HARBOR

Brooklyn 27th Street Yard

Brooklyn 56th Street Yard

Hoboken Yard

Staten Island Yard

BALTIMORE HARBOR

Baltimore Yard

GULF COAST

Beaumont Yard (Beaumont, Texas)

SAN FRANCISCO HARBOR

San Francisco Yard

Alameda Yard

SAN PEDRO HARBOR (Port of Los Angeles)

San Pedro Yard

GENERAL OFFICES

25 Broadway, New York 4, N. Y.



YOUR telephone receiver should treat each tone in the voice alike; that is important to you, because proper balance makes pleasant listening and easy understanding. Naturalness in receiver performance is pictured in a matter of seconds by the apparatus shown at left.

The receiver is clamped in place and an oscillator feeds into it frequencies representing all talking tones. Then a bright spot darts across an oscilloscope screen leaving behind it a luminous line which shows instantly

**It listens so
YOU
can hear better**

the receiver's response at each frequency. It is precise; and it is many times faster than the old method of measuring receiver performance point-by-point and then plotting a curve.

At Bell Laboratories, development of techniques to save *time* parallels the search for better *methods*. For each time an operation is made faster, men are freed to turn to other phases of the Laboratories' continuing job — making your telephone system better and easier for you to use each year.



BELL TELEPHONE LABORATORIES

EXPLORING AND INVENTING, DEVISING AND PERFECTING, FOR CONTINUED IMPROVEMENTS AND ECONOMIES IN TELEPHONE SERVICE.



Ships of the Navy

. . . BUILT BY New York Ship

Outstanding records, in two world wars, are the heritage of NEW YORK SHIP's naval vessels. From Battleships to Destroyers, ships by NEW YORK SHIP have served the United States Navy for over four decades . . . proof of sound design and construction.

Built by men who *know* Navy requirements, ships by NEW YORK SHIP are

a product of the latest methods of fabrication under the most exacting conditions. Complete facilities for fabrication of all major elements of a ship assure a single, unit responsibility for the entire contract.

Half a century of progress and background now stands behind the future construction of Ships for the Navy.

NEW YORK SHIPBUILDING CORPORATION

CAMDEN, NEW JERSEY



KEEPING ON THE RIGHT TRACK WITH Sperry Loran

- With Sperry Loran, the navigator has time and weather under his thumb. He can follow the shortest, most economical track night or day, in fog or storm, in far-out or close-in waters. Ships with Sperry Loran get accurate fixes up to 1400 miles from land in 2 to 6 minutes.

- Operation of Sperry Loran is simple . . . regular ship officers can operate Loran—no technician required. Accurate fixes are obtained by crossing 2 lines of position. A Time Difference Indicator for direct-reading of time difference saves time and prevents errors. Sperry Loran is independent of other navigational equipment.

New Sperry Mark II Direct-Reading Loran provides many advantages

The new Mark II Loran introduced this year by Sperry, offers improvements that provide simpler, speedier operation for bridge personnel.

Simplified matching of pulses. Automatic frequency control eliminates drift and aids in positioning signals.

Faster matching of signals. Delay controls are motor driven and continuous. They do not operate in steps, never come against a stop.

Improved readability. "Black light" (ultra-violet) lights up large numbers on time-difference indicator and station selectors, does

not interfere with night vision. Recessed scope face can be viewed in lighted chart room.

Optional mounting. Small size and separate power supply permits a choice of four mountings—table or shelf, deck, bulkhead or overhead. Control panel can be tilted to suit operator. The Mark II Loran is backed by Sperry's service organization. Write our nearest district office for additional information.



GYROSCOPE COMPANY

DIVISION OF THE SPERRY CORPORATION
GREAT NECK, NEW YORK
NEW YORK • CLEVELAND • NEW ORLEANS
LOS ANGELES • SAN FRANCISCO • SEATTLE

Seaworthy Alcoa Aluminum offers these advantages

LIGHT WEIGHT

CORROSION RESISTANCE

STRENGTH

NON-SPARKING

NON-MAGNETIC

WORKABILITY

APPEARANCE

REFLECTIVITY

CONDUCTIVITY



aids navigation

Lessen deviation of your ship's compasses with topside structures of nonmagnetic Alcoa Aluminum. You'll figure your weight saving in the tons, too. Weight saving that will increase speed and capacity . . . improve stability. You'll save maintenance dollars. For aluminum resists corrosion, eliminates frequent chipping and painting.

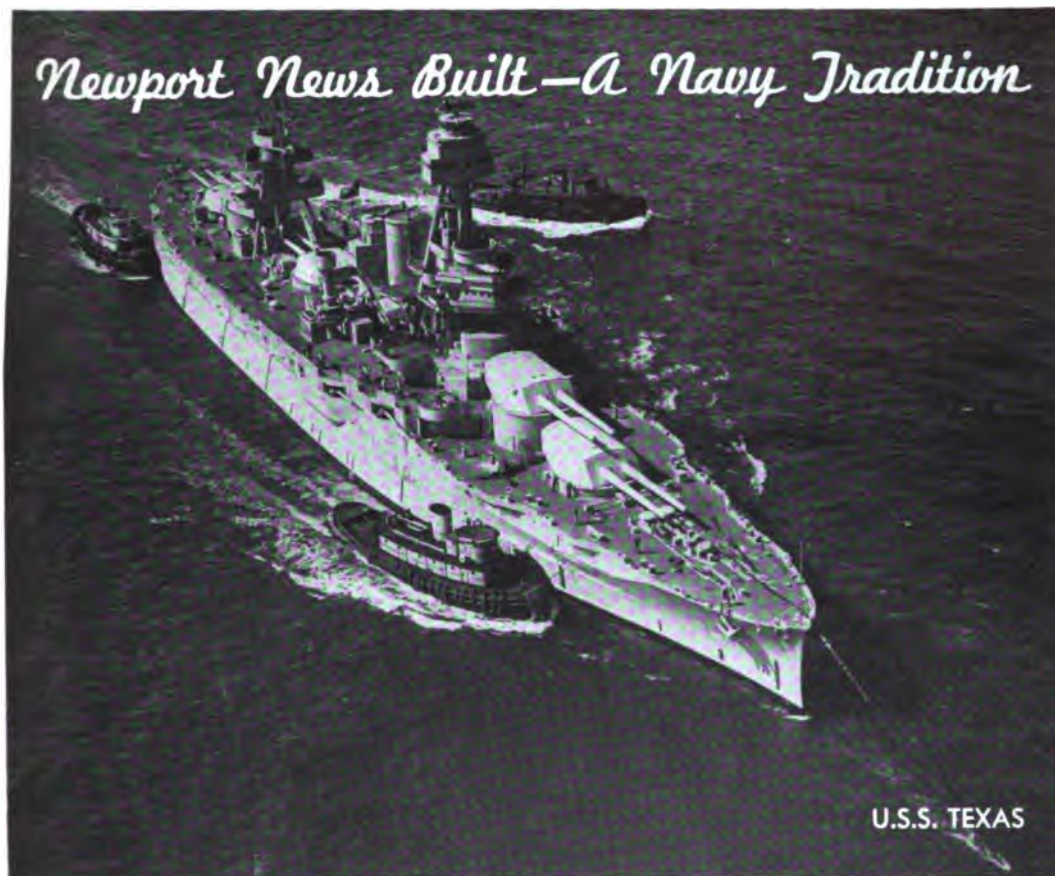
No other metal is as useful to the marine field as seaworthy Alcoa Aluminum. And no other aluminum supplier offers the technical help that Alcoa's Development Division is prepared to give you. You should have a copy of the book "Alcoa Aluminum and Its Alloys." Ask your nearby Alcoa sales office. Or write ALUMINUM COMPANY OF AMERICA, 2148-G Gulf Building, Pittsburgh 19, Pa.

ALCOA

FIRST IN ALUMINUM



INGOT • SHEET & PLATE • SHAPES, ROLLED & EXTRUDED • WIRE • ROD • BAR • TUBING • PIPE • SAND, DIE & PERMANENT MOLD CASTINGS • FORGINGS • IMPACT EXTRUSIONS
ELECTRICAL CONDUCTORS • SCREW MACHINE PRODUCTS • FABRICATED PRODUCTS • FASTENERS • FOIL • ALUMINUM PIGMENTS • MAGNESIUM PRODUCTS



Newport News' Hull No. 147 the U.S.S. TEXAS is shown leaving the water of her origin in Hampton Roads on her last voyage to the State of Texas. There she is permanently enshrined at the battlefield of San Jacinto.

Built more than thirty-four years ago this grand old battleship participated actively in two world wars. The TEXAS is another example in support of the sixty-two year old Newport News motto—"We shall build good ships."

NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY

(Established 1886)

NEWPORT NEWS

VIRGINIA



More speed...more range...more altitude —characterize the powerful new twin-jet fighter now being built by Douglas for the U. S. Navy.

Christened F3D *Skyknight*, the two-place combat craft is designed to equip Fleet carriers for 24-hour, all-weather operations. The new Douglas F3D *Sky-*

knight is adaptable as an attack fighter, long-range patrol or reconnaissance plane, or as a long-range fighter escort.

The *Skyknight* is the newest in a long line of dependable aircraft built for the Navy by Douglas Aircraft's El Segundo plant, producers of military aircraft for the past 17 years.

EL SEGUNDO PLANT OF **DOUGLAS**



U. S. NAVAL INSTITUTE

Founded in 1873

*For the advancement of professional, literary, and
scientific knowledge in the Navy*

U. S. NAVAL INSTITUTE PROCEEDINGS

PUBLISHED MONTHLY—ILLUSTRATED

* * *

REGULAR MEMBERS

Officers of the U. S. Navy, Marine Corps, and Coast Guard are eligible for Regular Membership. Members receive the twelve monthly issues of the PROCEEDINGS. Annual dues \$2.00.*

ASSOCIATE MEMBERS

Officers of the U. S. Army, U. S. Air Force, U. S. Coast and Geodetic Survey, U. S. Public Health Service, and Reserve Officers of all branches (Navy, Marine Corps, Coast Guard, Army, Air Force, Coast and Geodetic Survey, Public Health Service) are eligible for Associate Membership. In addition civilians are eligible for Associate Membership if they are U. S. citizens of good standing and character. Membership dues are the same as for Regular Members—namely, \$2.00* per year and entitle the member to receive the PROCEEDINGS each month at no additional cost.

SUBSCRIPTIONS

Messes, clubs, libraries, offices, organizations, etc., are not entitled to membership in the Naval Institute as are individuals. In order to receive the PROCEEDINGS, they must subscribe to it as they would to any other magazine. Individuals not desiring membership may subscribe. Subscription rate \$4.00* per year.

GIFT SUBSCRIPTIONS

Members desiring to give gift subscriptions may do so. Gift subscriptions do not include membership obligations and are entered in the same manner as subscriptions to other magazines are entered. The gift subscription rate to members is \$2.50* a year.

* Members and subscribers in foreign countries, \$1.00 extra for postage.

APPLICATION FOR MEMBERSHIP

U. S. NAVAL INSTITUTE,
ANNAPOLIS, MARYLAND.

Date

I hereby apply for membership in the U. S. Naval Institute and enclose \$2.00 in payment of dues for the first year, PROCEEDINGS to begin with the issue. I am interested in the objects and purposes of the Institute, namely, the advancement of professional, literary, and scientific knowledge in the Navy. I am a citizen of the United States and understand that members are liable for dues until the date of receipt of their written resignations.

NAME

PROFESSION

ADDRESS

PUBLICATIONS

U. S. NAVAL INSTITUTE, ANNAPOLIS, MARYLAND

Members of the Institute, both regular and associate, are allowed a discount of 10 per cent on books in this list unless otherwise indicated.

(Prices subject to change without notice.)

ATHLETICS

Modern Fencing.

By Clovis Deladrier, Head Fencing Master, U. S. Naval Academy. 1948. 312 pages. Illustrated. \$5.00 postpaid.

Physical Training Manual.

By the Department of Physical Training. 1942. 322 pages. Illustrated. \$2.25 postpaid.

Naval Aviation Physical Training Manuals. (1943 and 1944. Illustrated.)

Basketball. 268 pages. \$3.00 postpaid.

Boxing. 296 pages. \$3.00 postpaid.

Football. 256 pages. \$3.00 postpaid.

Gymnastics and Tumbling. 484 pages. \$4.50 postpaid.

Hand-to-Hand Combat. 238 pages. \$3.00 postpaid.

Mass Exercise, Games, Tests. 246 pages. \$3.00 postpaid.

Military Track. 186 pages. \$3.00 postpaid.

Soccer. 192 pages. \$3.00 postpaid.

Sports Program. 220 pages. \$3.00 postpaid.

Swimming. 342 pages. \$3.75 postpaid.

Wrestling. 172 pages. \$3.00 postpaid.

BIOGRAPHY

Admiral de Grasse and American Independence.

By Professor Charles L. Lewis, U.S.N.A. 1945. 404 pages. \$3.30 postpaid.

John Paul Jones: Fighter for Freedom and Glory.

By Lincoln Lorenz. 1943. 868 pages. Illustrated regular edition \$5.50 postpaid. \$5.00 to members. Autographed limited edition \$7.00 postpaid (no discount).

David Glasgow Farragut.

By Professor Charles L. Lewis, U.S.N.A.

Vol. I, *Admiral in the Making*. 1941. 386 pages. Illustrated. \$4.25 postpaid. \$3.30 to members.

Vol. II, *Our First Admiral*. 1943. 530 pages. Illustrated. \$5.00 postpaid. \$4.00 to members.

Admiral Franklin Buchanan.

By Professor Charles L. Lewis, U.S.N.A. 1929. 285 pages. \$2.00 postpaid.

Matthew Fontaine Maury.

By Professor Charles L. Lewis, U.S.N.A. 1927. 264 pages, \$4.50 postpaid.

ENGINEERING

Alternating Current Circuits and Machinery.

By the Department of Electrical Engineering. 1945. 248 pages. \$3.30 postpaid.

Energy Analysis of Naval Machinery.

By the Department of Marine Engineering. 1940. 550 pages. Illustrated. \$4.50 postpaid.

Engineering Materials and Processes.

By Lieutenant B. F. Brown, U. S. Naval Reserve. 1946. 210 pages. Illustrated. \$4.25 postpaid.

Internal-Combustion Engines.

By the Department of Marine Engineering. 1937. 5th edition. 212 pages. Illustrated. \$2.75 postpaid.

Naval Machinery.

By the Department of Marine Engineering. Naval Academy textbook until July, 1946. 1941. 638 pages. Illustrated. \$5.50 postpaid.

Naval Machinery.

By the Department of Marine Engineering. 1946. (2 volumes, each 8¼ x 11 inches, 2 columns to a page.)

Volume I covers "Naval Boilers" and "Naval Turbines." 336 pages and 21 large folded inserts. \$4.50 postpaid.

Volume II covers "Naval Auxiliary Machinery" and "Naval Reciprocating Engines." 420 pages and one large folded insert. \$4.75 postpaid.

Both volumes contain hundreds of illustrations, many in colors, reproduced from drawings of the highest quality, made by experienced draftsmen.

Principles of the Basic Mechanisms.

By the Department of Marine Engineering. 1947. 234 pages. Illustrated \$2.50 postpaid.

HISTORY

Lion Six.

By Captain D. Harry Hammer, U. S. Naval Reserve. The story of the building of the great Naval Operating Base at Guam. 1947. 125 pages. Illustrated. \$2.50 postpaid.

Sons of Gunboats.

By Commander F. L. Sawyer, U. S. Navy (Retired). Personal narrative of gunboat experiences in the Philippines, 1899-1900. "The Ancient and Honorable Sons of Gunboats." 1946. 166 pages. Illustrated. \$2.75 postpaid.

A History of Naval Tactics from 1530 to 1930.

The Evolution of Tactical Maxims. By Rear Admiral S. S. Robison, U. S. Navy (Retired), and Mary L. Robison. 1942. 892 pages. Illustrated. \$6.50 postpaid.

The Battle of Jutland.

By Commander H. H. Frost, U. S. Navy. 592 pages: 71 sketches and 15 halftone illustrations. 1936. \$5.00 postpaid.

Naval Warfare under Oars. 4th to 16th centuries.

By Vice Admiral William L. Rodgers, U. S. Navy (Retired). 1940. 372 pages. Illustrated. \$5.50 postpaid. \$4.40 to members.

The Dardanelles Expedition.

By Captain W. D. Puleston, U. S. Navy. 2d edition. 1927. 172 pages including 70 illustrations. \$3.00 postpaid. \$2.50 to members.

Some Stories of Old Ironsides.

By Commander H. H. Frost, U. S. Navy. 1931, 32 pages. Illustrated. Paper cover. \$.25 postpaid. (No discount.)

We Build a Navy.

By Lieutenant Commander H. H. Frost, U. S. Navy. A vivid and dramatic narrative of our early Navy. 1929. 517 pages. Illustrated. \$2.75 postpaid.

Yankee Mining Squadron.

By Captain R. R. Belknap, U. S. Navy. 1920. 110 pages. Illustrated. \$1.50 postpaid.

LANGUAGES

New Naval Phraseology. (In six languages.)

By the Department of Foreign Languages. 1944. 336 pages. \$2.20 postpaid.

Combats et Batailles sur Mer. (In French.)

Combates y Batallas en el Mar. (In Spanish.)

Story of *Emden* and Battles of Coronel and Falklands. By C. Farrere and P. Chack. Each about 130 pages. Paper cover. \$2.20 each postpaid.

Russian Supplement to New Naval Phraseology.

By the Department of Foreign Languages. 1946. 152 pages. \$3.50 postpaid.

MATHEMATICS

Analytic Mechanics.

By Associate Professor A. E. Currier, U.S.N.A. 1948. 316 pages. \$4.75 postpaid.

Refresher Course in Fundamental Mathematics for Basic Technical Training.

Prepared by Training Division, Bureau of Naval Personnel, Navy Department. 1942. 176 pages. Paper cover. \$.30 postpaid. (No discount.)

Spherical Trigonometry.

By the Department of Mathematics. 1946. 92 pages. \$2.20 postpaid.

Plane and Spherical Trigonometry.

By H. T. Muhly and S. S. Saslaw. 1948. 220 pages. \$3.00 postpaid.

Logarithmic and Trigonometric Tables.

By the Department of Mathematics. 1945. 93 pages. \$1.65 postpaid.

MISCELLANEOUS

Sailing and Small Craft down the Ages.

By E. L. Bloomster. 1940. 290 pages. 425 silhouette drawings. Trade edition \$5.50 postpaid. \$4.40 to members. De luxe autographed edition \$12.50 postpaid. \$10 to members.

Physics of Aviation—An Elementary Text on the Theory of Flight.

Prepared by the Department of Electrical Engineering. 1944. 150 pages. Illustrated. \$1.40 postpaid.

Refresher Shorthand in Naval Terminology.

By Anne A. Stewart and Kathleen V. Sullivan. Designed for, and sale limited to, participants in training and work improvement programs of U. S. Navy and U. S. Coast Guard. 1947. 142 pages. Paper cover. \$.70 postpaid.

Naval Customs, Traditions, and Usage.

By Lieutenant Commander Leland P. Lovette, U. S. Navy. 3d edition. 1939. 424 pages. Illustrated. \$2.20 postpaid.

Books of the Sea.

By Professor Charles L. Lewis, U.S.N.A. 1943. 328 pages. \$3.30 postpaid.

Naval Leadership with Some Hints to Junior Officers and Others.

A compilation for and by the Navy. 4th edition. 1939. 140 pages. \$.90 postpaid.

Naval Administration, Vol. I.

By the Department of Seamanship and Navigation. 1943. 226 pages. Paper cover. \$.70 postpaid.

Personnel Administration at the Executive Level.

By N. G. Asbury. 1948. 52 pages. Illustrated. Paper cover. \$2.75 postpaid.

International Law for Naval Officers.

By Comdr. C. C. Soule, U. S. Navy, and Lieut. Comdr. C. McCauley, U. S. Navy. 245 pages. Revised 1928 by Lieut. Comdr. C. J. Bright, U. S. Navy. \$2.20 postpaid.

Naval Aviation.

By the Training Division, Bureau of Aeronautics. 1943. 158 pages. Illustrated. \$2.20 postpaid.

How to Survive on Land and Sea.

Naval Aviation Physical Training Manual. 1943. 278 pages. Illustrated. \$2.20 postpaid.

Index to Proceedings (Nos. 1 to 100) and (Nos. 101 to 200):

\$1.50 each, postpaid. (No discount.)

Naval Essays of Service Interest.

Collection of 35 selected PROCEEDINGS articles for over 26-year period. 1942. Cloth cover \$1.50. Paper cover \$1.25 postpaid. (No discount.)

U. S. Naval Academy 90th Anniversary Number—October, 1935, "Proceedings."

224 pages. Paper cover. \$.50 postpaid. Blue cloth \$1.25 postpaid. (No discount.)

U. S. Naval Academy 100th Anniversary Number—April, 1946, "Proceedings."

164 pages. Paper cover. \$.50 postpaid. (No discount.)

NAVAL CONSTRUCTION

Principles of Warship Construction and Damage Control.

By Lieut. Comdr. G. C. Manning (C. C.), U. S. Navy, and Lieut. Comdr. T. L. Schumacher (C. C.), U. S. Navy. 1935. 396 pages. Illustrated. \$2.50 postpaid.

Structural Design of Warships.

By Doctor William Hovgaard. 2d edition, revised and enlarged. 1940. 425 pages. Illustrated. \$6.60 postpaid.

NAVAL ORDNANCE

Exterior Ballistics Pamphlet.

By Department of Ordnance and Gunnery. 1948. 76 pages. Paper cover. \$.70 postpaid.

Range and Ballistic Tables.

Contains tables required for *Exterior Ballistics Pamphlet*. 1946. \$2.50 postpaid.

Naval Ordnance.

By the Department of Ordnance and Gunnery. 1937. (Reprinted 1939 with corrections.) 482 pages. Illustrated. \$6.60 postpaid.

Exterior Ballistics.

By Lieutenant Commander E. E. Herrmann, U. S. Navy. 1935. 305 pages. \$2.75 postpaid.

Range and Ballistic Tables.

Contains tables required for *Exterior Ballistics*. 1935. \$2.50 postpaid.

Naval Weapons and Their Uses.

By the Department of Ordnance and Gunnery. 1943. 80 pages. Illustrated. Paper cover. \$.45 postpaid.

NAVIGATION

Navigation and Nautical Astronomy.

Originally by Commander Benjamin Dutton, U. S. Navy. Revisions by the Department of Seamanship and Navigation. A textbook for the instruction of midshipmen and officers of the U. S. Navy. 9th edition. 1948. 876 pages. \$4.00 postpaid.

Mathematics for Navigators—A Supplement to Dutton's Navigation and Nautical Astronomy.

1940. 30 pages. Paper cover. \$.05 postpaid.

Introduction to Astronomy.

By the Department of Seamanship and Navigation. Background of astronomy necessary to study of navigation. 1941. 60 pages. Illustrated. Paper cover. \$.55 postpaid.

Practical Manual of the Compass.

By Captain Harris Laning, U. S. Navy and Lieut. Comdr. H. D. McGuire, U. S. Navy. 1921. 172 pages. Illustrated. \$3.60 postpaid.

PICTORIAL

Around the World with the Fleet, 1907-1909.

280 pages of pictures taken on that cruise. 1929. \$1.50 postpaid.

The Five Ages.

In colors illustrating "Age of Oars," "Age of Oars and Sail," "Age of Sail," "Age of Sail and Steam," and "Age of Steam." Outside size 9" x 12". Set of five, \$1.00 postpaid.

RADIO

Basic Course in Electronics.

By the Department of Electrical Engineering. 1948. 394 pages. Illustrated. \$5.00 postpaid.

Robison's Manual of Radio Telegraphy and Telephony.

By Captain S. C. Hooper, U. S. Navy. 8th revised edition. 1928. 791 pages. Illustrated. \$4.40 postpaid.

SEAMANSHIP

Rules of the Nautical Road.

By Commander R. F. Farwell, U. S. Naval Reserve. 2d edition. Corrected and reprinted 1945. 446 pages. Illustrated. \$2.50 postpaid.

Watch Officer's Guide.

By Captain Russell Willson, U. S. Navy. Corrected and reprinted 1945. 276 pages. \$1.25.

The Bluejackets' Manual, U. S. Navy.

13th edition. 1946. 622 pages. Illustrated. \$1.25 postpaid.

On a Destroyer's Bridge.

By Commander H. H. Frost, U. S. Navy, 1930. 130 pages. Illustrated. \$2.20 postpaid.

Practical Knots and Splices.

By Kenneth E. Cahoon. 1942. 78 pages. Illustrated. \$.70 postpaid.

* * * * *

ORDER BLANK

Remittance \$. enclosed or bill me for the following:

.....
.....
.....
.....
.....
.....

Name

Address

.....

Book Department

For the benefit of our members, both regular and associate, the Institute Book Department will supply any obtainable naval, professional, or scientific book. A discount of 10% is allowed on books of other publishers (except on foreign and government publications and on books on which publishers do not give a discount). Allow reasonable time for orders to be cleared and books to be delivered directly to you by publishers. The trouble saved the purchaser through having one source of supply of all books should be considered. The cost will not be greater and generally less than when obtained direct from dealers.

Address **SECRETARY-TREASURER**
U. S. Naval Institute, Annapolis, Maryland

AMERICAN
FLEXIBLE BRONZE STEAM HOSE
Diesel Engine Exhaust Hose
Flexible Seamless Tubing
Flexible Steel Oil Hose

ANACONDA
BRASS COMPANY
WATERBURY, CONN.

THE AMERICAN BRASS COMPANY
AMERICAN METAL HOSE BRANCH
General Offices: WATERBURY 88, CONN.

ORDNANCE FORGINGS
Complete control—from making the basic electric steel to final machining and inspection—assures the invariable quality of all the National forgings made to Navy specifications.



NATIONAL FORGE & ORDNANCE COMPANY
IRVINE, WARREN COUNTY, PENNA.
Washington Office: 1213 17th St., N. W.

A Five Star Plant

LONG RANGE ECONOMY ON SHIPBOARD INSTALLATIONS



(a) Single conductor rubber insulated cable



(b) Multi-conductor Navy Type power cable



(c) Varnished cambric marine cable with basketweave armor

SHIPBOARD CABLES

LONG RANGE ECONOMY ON SHORE APPLICATIONS



(d) Okolite-Okoprene—up to 5000 volts



(e) Okolite-Okoprene—high voltage



(f) Varnished cambric braided

SHIPYARD CABLES

The lifetime cost of a cable rather than its first cost is the only true measure of cable economy today. Long-lived Okonite cables, built to stand up better and longer, can offset today's high installation costs.

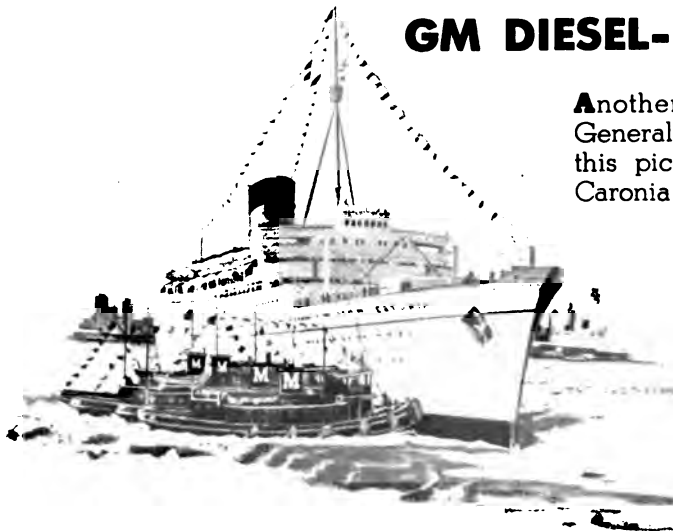
Illustrated above are three of many Okonite-engineered cables for service at sea, as well as three of many cables for shore installations. From Okonite you can get cables that fully meet U. S. Navy and AIEE Specifications. For information write The Okonite Company, Passaic, N. J.

7253

OKONITE  **insulated wires and cables**

Powerful Example of

GM DIESEL-ELECTRIC DRIVE



Another powerful demonstration of General Motors Diesel-Electric Drive is this picture of the 34,183-ton R.M.S. Caronia being eased into her berth by six units of the famous "M" Diesel-Electric fleet of the Moran Towing & Transportation Company, Inc.

Wherever sure-fire, flexible power is needed, GM Diesel-Electric Drive is first choice. GM Diesel-Electric Drive is the power plant that pays its way!

Leader in Diesel engineering development for 37 years

CLEVELAND DIESEL ENGINE DIVISION

CLEVELAND 11, OHIO

GENERAL MOTORS

Mention the Naval Institute—It Identifies You



ENGINES FROM
150 TO
2000 H. P.

Northern Ordnance Incorporated

Division of
Northern Pump Company

Hydraulic Machinery and Gun Mounts
MINNEAPOLIS, MINNESOTA

THE TREDENNICK-BILLINGS CO.

Building Construction
10 High St., Boston, Mass.



FATHOMETER
... instantly reports the changing
depths of water beneath your keel.
SUBMARINE SIGNAL DIVISION
BAYHEON MANUFACTURING COMPANY, Waltham 54, Massachusetts

Johns-Manville
INSULATIONS • PACKINGS

MARINITE
BULKHEADS FOR
AUXILIARY VESSELS

JM

22 EAST 40TH ST. - NEW YORK 16, N.Y.

MUELLER BRASS CO.

PORT HURON, MICHIGAN

Brass, Bronze and Aluminum forgings and Screw Machine Parts for aircraft, torpedoes, naval craft, guns and many other types of munitions.

STREAMLINE Solder fittings and Seamless Copper Pipe for Marine and Government piping systems.

Valves, Fittings and Accessories for mechanical refrigeration. "600" Bearing Metal for these tough jobs.

PLASTIC FORMS FOR AIRCRAFT

- Cockpit Canopies
- Astrodomes
- Aircraft Windows

*Plastic laminated on
Lucite and Plexiglas*

AEROPLASTICS, INC.

8845 W. Olympic Blvd.
Beverly Hills, Calif.

Mention the Naval Institute—It Identifies You

SILENT ELEVATOR SERVICE



made possible by IMO OIL PUMP

THIS quiet, reliable, pulsation-free, vibrationless pump is just the thing for hydraulic elevator operation—or any other service where noise is a nuisance and reliability is essential.

De Laval-IMO pumps are available for general handling of oil and fluids over a wide range of viscosities.



Send for Catalog LE-U

IMO PUMP DIVISION of the
DE LAVAL STEAM TURBINE CO.
TRENTON 2, NEW JERSEY



"CHALLENGER"

This 1456 ton Down Easter was launched at Bath, Maine, in 1877 by E. & A. Sewall.

The influence of such grand old carriers as the CHALLENGER is evidenced in the modern HYDE DECK MACHINERY you find on ships today. The building of hand operated windlasses for meeting the requirements of "windjammers" nearly a century ago, taught the unforgettable lesson that absolute dependability under all conditions is the primary requirement for all marine equipment.

HYDE WINDLASS COMPANY
BATH, MAINE

HYDE DECK MACHINERY

WORKING WITH THE NAVY
... since 1934

Fifteen years ago Farrel started an intensive program of engineering and manufacturing development of the types required by the Navy. Since then, these designs have been proved at sea in over 1200 ships of more than thirty different types.

**A—Engines
B—Couplings
C—Gears**

FARREL-BIRMINGHAM CO., INC.
Marine Division
3700 Chrysler Building
New York 17, N. Y.

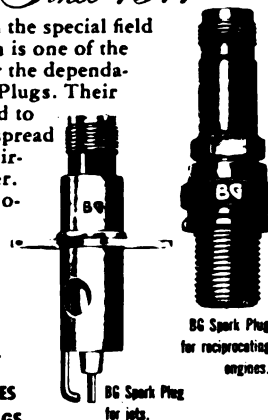
FB-517

W *Symbol of
Dependable Service
Since 1917*

Long experience in the special field of aviation ignition is one of the notable reasons for the dependability of BG Spark Plugs. Their high quality has led to their present widespread use in all types of aircraft the world over. Whether for reciprocating or jet engines,—you may avail yourself of our experience by discussing your particular needs with BG engineers.

**FOR AIRCRAFT ENGINES
AIRCRAFT SPARK PLUGS**

THE BG CORPORATION
NEW YORK 19, N. Y.



Mention the Naval Institute—It Identifies You



DREDGING
 •
CONSTRUCTION
 •
ENGINEERING
Distributors of
SAND - GRAVEL - STONE
COMMERCIAL SLAG
 •
THE ARUNDEL CORPORATION
BALTIMORE 2, MD.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

TOOLS for VICTORY

In times of peace, Blaw-Knox builds and equips complete plants for industry.

But should the need arise, Blaw-Knox stands ready—and prepared—to produce again the tools for survival, the materiel needed by the armed forces.

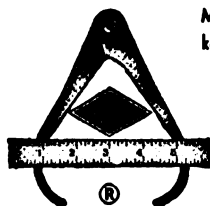


★ ★ ★ ★ ★ ★ ★ ★

BLAW-KNOX
COMPANY
PITTSBURGH, P.A.

Representatives in Principal Cities

GARLOCK



Mechanical Packings . . . Gas-kets . . . Kloseure Oil Seals . . .
 Molded Rubber and Asbestos Goods.

THE GARLOCK PACKING COMPANY
 Palmyra, New York

WARREN

STEAM PUMP COMPANY, INC.
 WARREN, MASS.

PUMPS

WATERBURY TOOL

Division of Vickers Incorporated
VARIABLE SPEED HYDRAULIC TRANSMISSIONS
WATERBURY 91, CONNECTICUT

STANDARD DREDGING CORPORATION

Galveston, Texas
 320 Cotton Exchange Bldg.

MARITIME EXCHANGE BLDG.
 80 BROAD STREET, NEW YORK 4, N.Y.
 Telephone WHitehall 4-7660

New Orleans 12, La.
 Whitney Bldg.

Los Angeles 14, Calif.
 800 Central Bldg.

Harbor Improvements, Dredging, Breakwaters
 Land Reclamation, Canals, Dredging Machines

Honolulu, T.H.
 Aloha Tower

Mention the Naval Institute—It Identifies You

ARMSTRONG

SETTING-UP

TOOLS



Few tool investments pay dividends as consistently as an investment in ARMSTRONG Setting-Up Tools.

These correctly designed, strong and convenient tools cut setting-up time to a minimum. They save machine and man hours day after day and assure rigid set-ups for accurate work, prevent accidents and reduce spoilage.

Stocked by Leading Tool Departments

Write for new S-48 Catalog, just released.

ARMSTRONG BROS. TOOL CO.



"The Tool Holder People"

5226 W. Armstrong Ave., Chicago 30, U.S.A.
New York San Francisco



LOOK TO EDO

Because of their 24 years' experience in building rugged seaplane floats, EDO engineers and craftsmen are more and more frequently called on to develop, engineer and manufacture all types of precision aluminum components, from complete aircraft to advanced shipping containers.

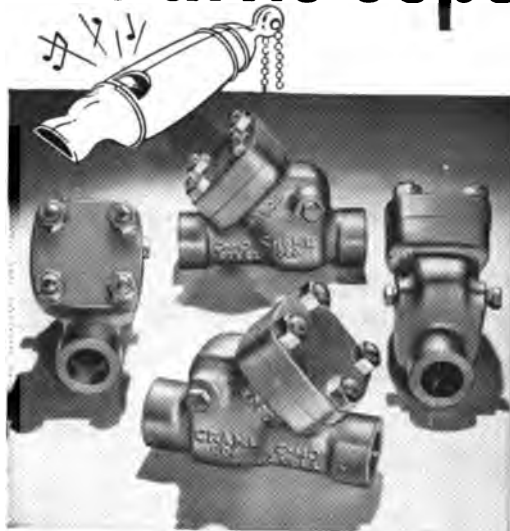
In addition, EDO's Electronics Division is pioneering in the development and manufacture of highly important electronic devices.

Look with confidence to EDO for:

- CREATIVE ENGINEERING
- ELECTRONIC EQUIPMENT
- PRECISION ALUMINUM FABRICATION
- SEAPLANE FLOATS

EDO

traffic cops



...ABOARD SHIP

These "traffic cops" on Navy's ships keep steam, water, oil, air and other vital fluids moving in the right direction. In case of pipe line breaks, they automatically stop backflow; keep piping services intact.

Unusually compact, these 600-pound cast C-Mo steel swing check valves were designed exclusively for Navy by Crane. They're the regrinding type, with a tilted, bolted cap providing easy access for servicing.

Ever since Navy took to steam, Navy and Crane engineers have partnered in developing all types of piping equipment for severest sea duty. However exacting the specifications, Crane can match them with experience, manpower, and machinery found only in the world's largest valve and fitting manufacturing plant.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.

Branches and Wholesalers Serving All Industrial Areas

VALVES • FITTINGS • PIPE • PLUMBING AND HEATING



Mention the Naval Institute—It Identifies You

PROVEN IN THE SERVICE

For 50 years, Cutler-Hammer, Pioneer Electrical Manufacturer, has furnished dependable control to all departments of the United States government. Built to specifications . . . backed by an outstanding record of performance.

CONTROL APPARATUS FOR ALL MARINE USES

Motor Control for Every Service, Ventilating Fans, Pumps, Cargo Winches, Capstans, Windlasses, Laundry Machines, etc.

Magnetic Brakes,
Motor Operators for Valves,
Limit Switches,
Solenoids, Rheostats,



Pressure Regulators,
Magnetic Clutches,
Watertight Door Control,
Pushbuttons

CUTLER-HAMMER, Inc., 1217 St. Paul Avenue, MILWAUKEE 1, WIS.

FARRAND OPTICAL CO., INC.

Bronx Blvd. & E. 238th St.

NEW YORK

Engineers, Designers and Manufacturers

Periscopes

Rangefinders

Gun Fire Control Apparatus

Optical Instruments

United States Navy

Bureau of Ordnance



Naval Ordnance Development Award



INSURANCE AT COST!

**AUTOMOBILE, HOUSEHOLD and
PERSONAL PROPERTY**

**ALL SAVINGS are Returned to Members Upon
Expiration of Policy**

**MEMBERSHIP RESTRICTED
to Commissioned and Warrant Officers
in Federal Services**



UNITED SERVICES AUTOMOBILE ASSOCIATION

A Non-Profit Association Established in 1922

**1400 E. GRAYSON ST.
SAN ANTONIO 8,
TEXAS**

Mention the Naval Institute—It Identifies You

THE BERWIND-WHITE COAL MINING CO.
Proprietors, Miners and Shippers of
Berwind's Eureka, Berwind's Standard New River and Berwind's
Standard Pocahontas
SMOKELESS STEAM COALS

Also
Berwind's Standard Elkhorn
OFFICES

New York 4—No. 1 Broadway
 Philadelphia 2—Commercial Trust Building
 Baltimore 2—Keyser Building

Boston 10—Atlantic Coal Co., Agents, 80 Federal Street
 Chicago 4—Berwind Fuel Co., 141 West Jackson Blvd.
 Covington, Va.—Cabell Coal Co., Inc.

New York {Eureka Pier, Harsimus
 {Sixth Street, Jersey City
 Philadelphia—Greenwich Piers

SHIPPING WHARVES

Baltimore—Canton Piers
 Newport News and Norfolk, Va.
 Superior, Wisconsin

Duluth, Minnesota

EUROPEAN AGENTS

Cory Brothers Co., Ltd., 59 St. Mary Axe, London, E. C. 3
 Wilson, Sons & Co., Ltd., Salisbury House, London, E. C. 2

**FROM BOW
 TO STERN**



**EXTRA PROTECTION
 AGAINST SLIPPING ACCIDENTS**

Grip Without A Slip!

Easy To Clean!

Easy To Match!

AW SUPER-DIAMOND
 FLOOR PLATES THAT GRIP

Pattern shown 1/2 actual size

On board ship AW Super-Diamond Floor Plate is used extensively for: Boiler & Engineroom Floors, Walkways; Decks, Shaft-Alley Cover Plates. It's furnished in Ferrous or Non-Ferrous Metal.

USN Approved—Specification 47S18C

ALAN WOOD STEEL COMPANY
 Conshohocken, Pennsylvania

**FLIGHT DATA
 RECORDER**

Flight Recorder 9921 is a continuous-strip recording instrument designed for use with Giannini end-instruments such as accelerometers, altitude transmitters, directional transmitters, etc.

Recently expanded manufacturing facilities afford firm delivery of 1949 improved instrument and powerplant equipment.



Latest Technical Catalogs on Request

Giannini & CO INC

285 W. Colorado, Pasadena 1, California
 697 Morris Turnpike, Springfield, N. J.

PACIFIC PUMPERS

Navy men the world over know the Type NY Pacific Pumper as the "Handy Billy." Other models are the standard weapons against fire in the forests and wherever powerful, light-weight portable pumps are needed. Manufactured by

Fire Equipment Division

PACIFIC MARINE SUPPLY CO.
 Seattle 1, Washington

Order Books of All

Publishers Through

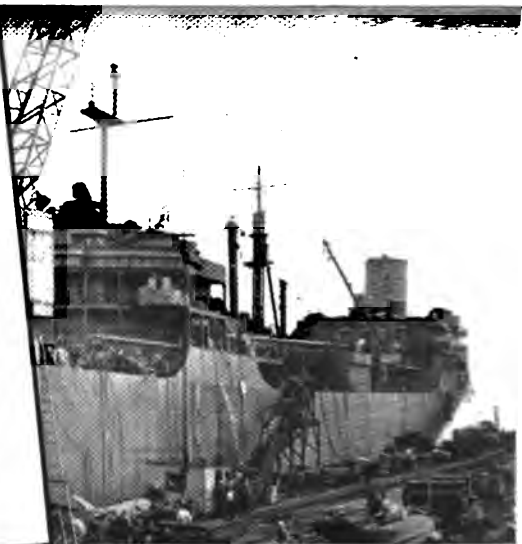
U. S. Naval Institute's

Book Department

Mention the Naval Institute—It Identifies You

NEW CONSTRUCTION AND RECONVERSION . . .

As builders of record-making tankers, Sun is playing an important part in the constantly increasing trans-ocean shipment of oil. Sun facilities are also available for reconverting and repairing, and the building and reconditioning of every type of merchant craft.



Sun

SHIPBUILDING & DRY DOCK COMPANY

ON THE DELAWARE • CHESTER, PA.
25 BROADWAY • NEW YORK CITY

FORD INSTRUMENT COMPANY, INC.

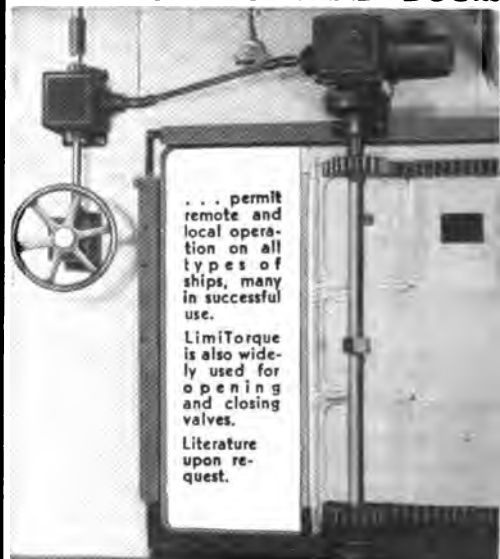
Division of The Sperry Corporation

31-10 Thomson Ave.
Long Island City 1, N.Y.

Manufacturers of
Super-Precision
Instruments and Mechanisms
Paper Converting Machinery
and Printing Presses

LIMITORQUE CONTROLS

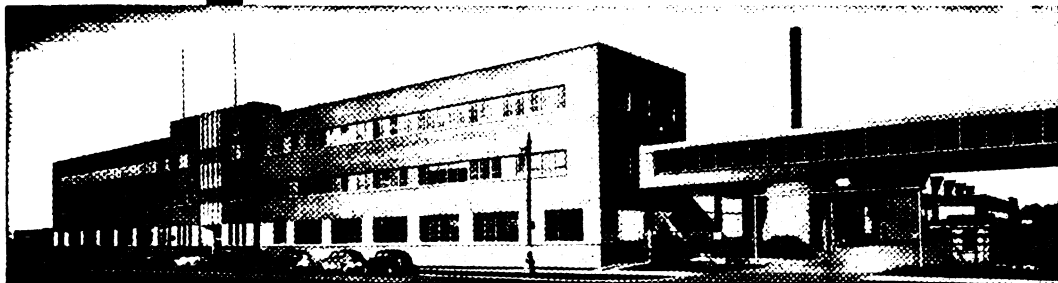
. . . for Electrically Operated
WATER-TIGHT BULKHEAD DOORS



PHILADELPHIA GEAR WORKS, INC.

Erie Ave. and G St. Philadelphia 34, Pa.
Manufacturers of Industrial Gears, Speed Reducers, Limitorque Valve Controls

Mention the Naval Institute—It Identifies You



These Modern **VICKERS**
Plants are devoted exclusively
to the development, design and
manufacture of special hydraulic
machinery and Vickers Hydraulic
Pumps and Controls

VICKERS Incorporated
DIVISION OF THE SPERRY CORPORATION
1400 Oakman Blvd., Detroit 32, Mich.

ENGINEERS AND BUILDERS
OF OIL HYDRAULIC
EQUIPMENT SINCE 1921

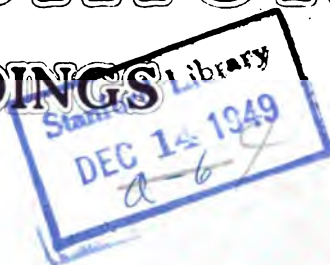
**U. S. NAVAL INSTITUTE
PROCEEDINGS**

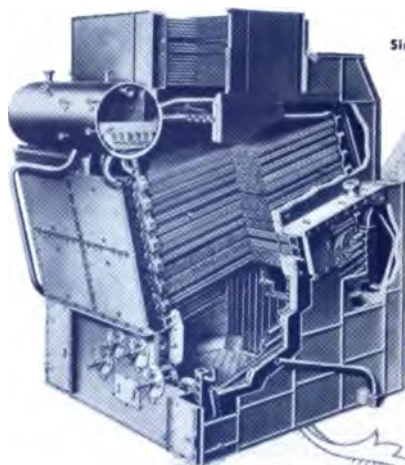
Vol. 75

DECEMBER, 1949

No. 12

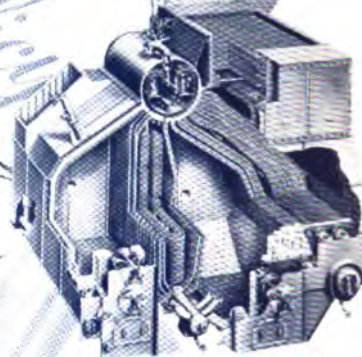
UNITED STATES NAVAL INSTITUTE PROCEEDINGS





Single-Pass, Header-Type Boiler

Single-Uptake, Controlled Superheat Boiler



Underwriting boiler performance with a single signature

Because their every component is the subject of a single unified responsibility for design, materials, construction, and performance, B&W boilers assure you dependable, low-cost steam for any marine service ... in river, lake or ocean. For over 70 years these units have met... and set... standards of economy and efficiency in steam-generation aboard both naval and merchant vessels.

Find out, as so many hundreds of other naval architects, ship-builders and owners already have, how you write-off responsibility when you light-off a B&W boiler.



**BABCOCK
& WILCOX**



Two-Drum Boiler

In addition to the Boilers illustrated, B&W builds Air Heaters, Economizers, Superheaters and Controls, Water-Wall Furnaces, Oil Burners, Boiler Tubes and Refractories... ALL the components for complete steam-generating units.



*Shipbuilders
and
Engineers*



BATH IRON WORKS
BATH, MAINE

SHIPS OF ADVANCED DESIGN AND FINISHED CONSTRUCTION
BUILT IN THE BIRTHPLACE OF AMERICAN SHIPBUILDING

FOR DEPENDABLE LONG LIFE

insist on

Nickel Alloy Steel Gears

There are two kinds of nickel alloy steel gears... those that are carburized, and those that are direct hardened.

CARBURIZED GEARS

The carburized gear is used in applications that require maximum wear resistance in the surface, as well as greatest surface compressive strength. With nickel alloy carburizing steels, this goal is consistently attained, together with development of extremely tough cores that resist shock loads, fatigue and bending stresses. Moreover, a chief cause of noisy gears...the distortion that accompanies heat treating...is inherently resisted by nickel alloy carburizing steels.

DIRECT HARDENED GEARS

The direct hardened steel gear is used to carry heavy tooth loading in applications where resistance to wear and surface compressive stresses is not quite so vital a factor. Here again, the nickel-containing steels develop the required strength more consistently and in heavier sections than carbon steels, and are generally more resistant to shock, fatigue and multi-axial stresses. Distortion resulting from heat treatment may be minimized by using nickel alloy steels and their machinability before final heat treatment is very good.

Giving greater play to the skill of the engineer, nickel alloyed steels not only provide increased strength without sacrificing ductility, but they

harden at lower temperatures which simplifies heat treatment and minimizes deformation and scaling.

MEET VARIED REQUIREMENTS

Nickel alloyed steels enable producers to meet virtually any reasonable requirements... whether dictated by revised stress analysis due to design changes, or by changed fabricating methods that demand better machining qualities or improved response to heat treatment.

MANY TYPES AVAILABLE

The many standard grades of nickel alloyed steels permit specifying the particular type which provides the best set of properties for any reasonable fabrication and service demands.

Unending competition for higher speeds and heavier loads, for quieter operating and longer machine life, provide opportunities for gear producers to drive ahead with nickel alloyed steels. Use the coupon for your copy of "Modern Trends in Nickel Steel and Cast Iron Gear Materials." This useful and informative booklet is yours for the asking. Send for it now.



MAIL COUPON FOR
VALUABLE BOOK

The International Nickel Company, Inc.
Dept. N.I.P., 67 Wall St., New York 5, N.Y.

Please send me a copy of:

"Modern Trends in Nickel Steel
and Cast Iron Gear Materials"

Name _____ Title _____

Company _____

Address _____

City _____ State _____

**THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET
NEW YORK 5, N.Y.**



NOW... for the first time

SUBSTANTIAL POWER

At Microwave Frequencies with Direct Crystal Control

Now, with two new Sperry Klystron tubes, stabilized frequency control is possible at 10,000 mc. with 1 watt continuous wave power output. These multiplier tubes, the SMC-11 and the SMX-32, permit direct crystal control at microwave frequencies with this power level.

Starting with a 5 mc. crystal, the frequency is multiplied to 830 mc. by use of an *Exciter*. The SMC-11 Klystron multiplies the 830 mc. to a frequency of 5,000 mc. The SMX-32 then multiplies this frequency to 10,000 mc. with the same accuracy which exists in the control crystal ($\pm 0.0005\%$).

This practical achievement of 1 watt power output with continuous accuracy of frequency control at 10,000 mc. exists only through the use of these two Sperry Klystrons.

Write our Industrial Department for further information.

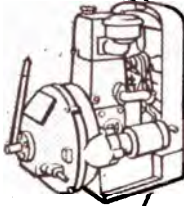
SPERRY

GYROSCOPE COMPANY

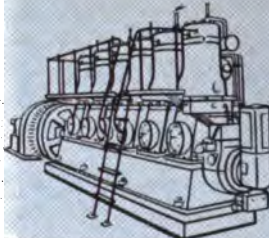
DIVISION OF THE SPERRY CORPORATION
GREAT NECK, NEW YORK

NEW YORK • CLEVELAND • NEW ORLEANS
LOS ANGELES • SAN FRANCISCO • SEATTLE

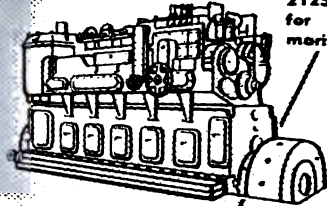
Model 45B: $5\frac{1}{4}$ horsepower engine for stationary and marine service.



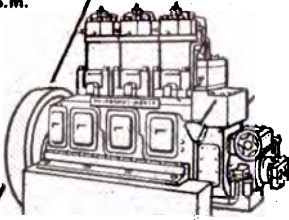
Model 32: Horsepower from 120 to 450. For slow-speed heavy-duty service.



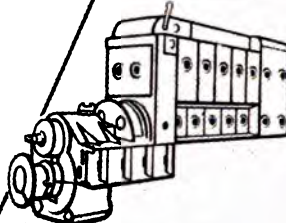
Model 37: 500 to 2125 horsepower for direct drive marine service.



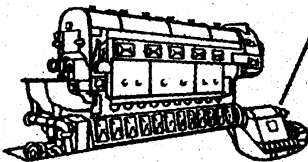
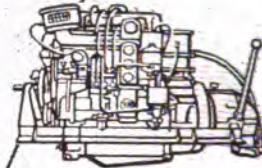
Model 42: 60 and 90 horsepower at 450 r.p.m.



Model 31: Horsepower from 175 to 500; with 2 to 1 reduction gears optional for marine service.

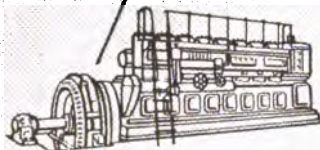


Model 48 Marine Engine: Also available for stationary or portable service. 3.5 to 80 hp.



Model 38 Opposed-Piston Engine: Horsepower from 960 to 1920 with 2 to 1 reduction gear for marine service.

Model 33 Stationary Engine: 500 to 2000 hp. Diesel, 1000 to 2000 hp. Dual Fuel.



When it comes to Diesel Power...

From 3.5 hp. to 3500 hp.

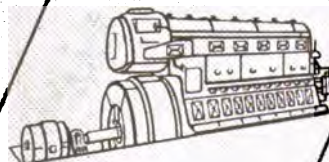
Low-cost, efficient power for all marine services modern, dependable power for newest, fastest road locomotives. economical power for largest to smallest municipal and industrial plants Fairbanks-Morse is the proved source for the full range of diesel applications. For skilled assistance and impartial recommendation for the diesel for your specific service, write Fairbanks, Morse & Co., Chicago 5, Ill.



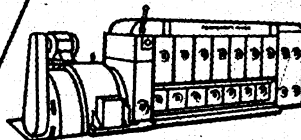
FAIRBANKS-MORSE

A name worth remembering

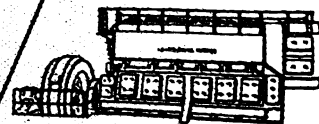
DIESEL LOCOMOTIVES • DIESEL ENGINES • PUMPS • SCALES
MOTORS • GENERATORS • STOKERS • RAILROAD MOTOR
CARS and STANDPIPES • FARM EQUIPMENT • MAGNETOS



Model 38 Opposed-Piston Engine: 960 to 1920 horsepower at 720 r.p.m.



Model 31: Diesel generating set with kw. ratings from 118 to 360. Marine and stationary—Dual Fuel available in larger sizes.



Model 31: 2100 to 3500 horsepower diesel or dual fuel engine for heavy-duty stationary service.



1891-1949

FIFTY-EIGHT YEARS OF SERVICE

Newport News Hulls No. 1 and 2 built in 1891 are shown on September 28, 1949, in the waters of their birth, Hampton Roads. After fifty-eight years of service both vessels are still working daily. Hull No. 1, formerly the DOROTHY, is now the J. ALVAH CLARK of the Wood Towing Corporation. Hull No. 2, formerly the EL TORO, is now the VIRGINIA of the Norfolk Dredging Company.

These two vessels are further operating evidence of the fulfilment of the policy established by the Newport News Founder, Collis P. Huntington: "We shall build good ships here at a profit if we can, at a loss if we must, but always good ships."

NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY

(Established 1886)

NEWPORT NEWS

VIRGINIA

**Seaworthy Alcoa Aluminum
offers these advantages**

LIGHT WEIGHT

CORROSION RESISTANT

STRENGTH

NON-MAGNETIC

NON-SPARKING

WORKABILITY

REFLECTIVITY

APPEARANCE

CONDUCTIVITY



makes tankers safer

Less fire hazard is only one of the reasons you'll want to specify nonsparking Alcoa Aluminum in your tankers. Deck structures and equipment of aluminum slash tons of topside weight. And because it resists corrosion, aluminum lessens maintenance, saves frequent chipping and painting. That means your vessels operate more economically.

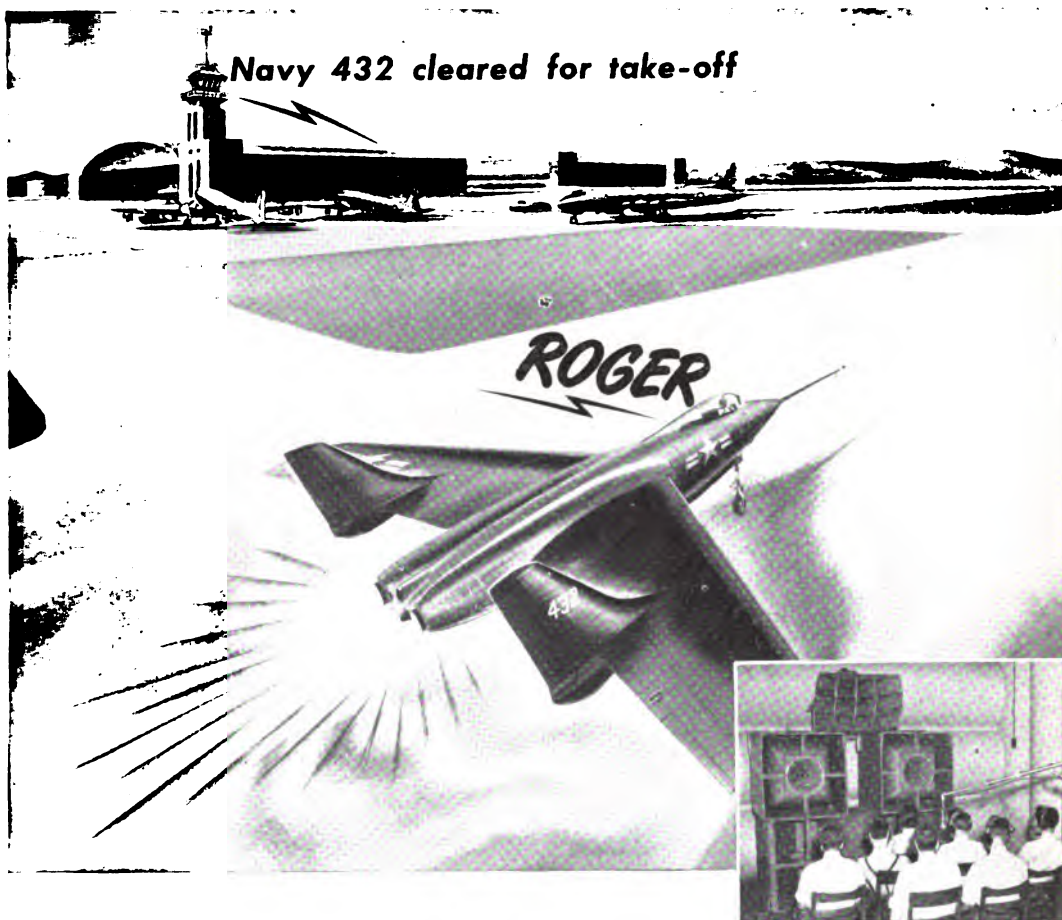
Whether you're building, buying or operating tankers, seaworthy Alcoa Aluminum offers you more advantages than any other metal. What's more, Alcoa's Development Division offers the best in technical guidance . . . help in problems of alloy selection and fabrication. Ask your Alcoa sales office for a copy of "Alcoa Aluminum and Its Alloys." Or write ALUMINUM COMPANY OF AMERICA, 2148M Gulf Building, Pittsburgh 18, Penn.

ALCOA

FIRST IN ALUMINUM



INGOT • SHEET & PLATE • SHAPES, ROLLED & EXTRUDED • WIRE • ROD • BAR • TUBING • PIPE • SAND, DIE & PERMANENT MOLD CASTINGS • FORGINGS • IMPACT EXTRUSIONS
ELECTRICAL CONDUCTORS • SCREW MACHINE PRODUCTS • FABRICATED PRODUCTS • FASTENERS • FOIL • ALUMINUM PIGMENTS • MAGNESIUM PRODUCTS



The story behind "ROGER"

The noise in the cockpit of a jet fighter plane preparing to take off is *deafening*. It compares with a battery of air hammers on a steel hull, or the roar of water at the base of Niagara Falls.

Yet, through this tremendous noise, the pilot must hear and understand his take-off instructions before he can "roger." To accomplish this, new and better electronic equipment, both to transmit and to receive messages, was required.

RCA research and engineering has provided the solution. This is the story:

Persons with normal hearing and vocal characteristics selected at random were seated in the sound-proofed room

illustrated above and fitted with experimental phones and microphones. Electronically generated noise, which synthesized a jet engine sound *exactly*, was amplified to a deafening roar—to the threshold of pain—and reproduced on the loudspeakers at the front of the room. Then over the earphones came words, words, words, and the test subjects wrote them down as they understood them.

Patiently, over a period of months, by constantly analyzing and changing, by improving microphones and earphones, and by developing special amplifiers, and by fitting them all together in a complementary manner, there finally evolved a complete system—microphones, earphones, and special amplifiers—through which the pilot

could understand and be understood—over the roar of his jet engine.

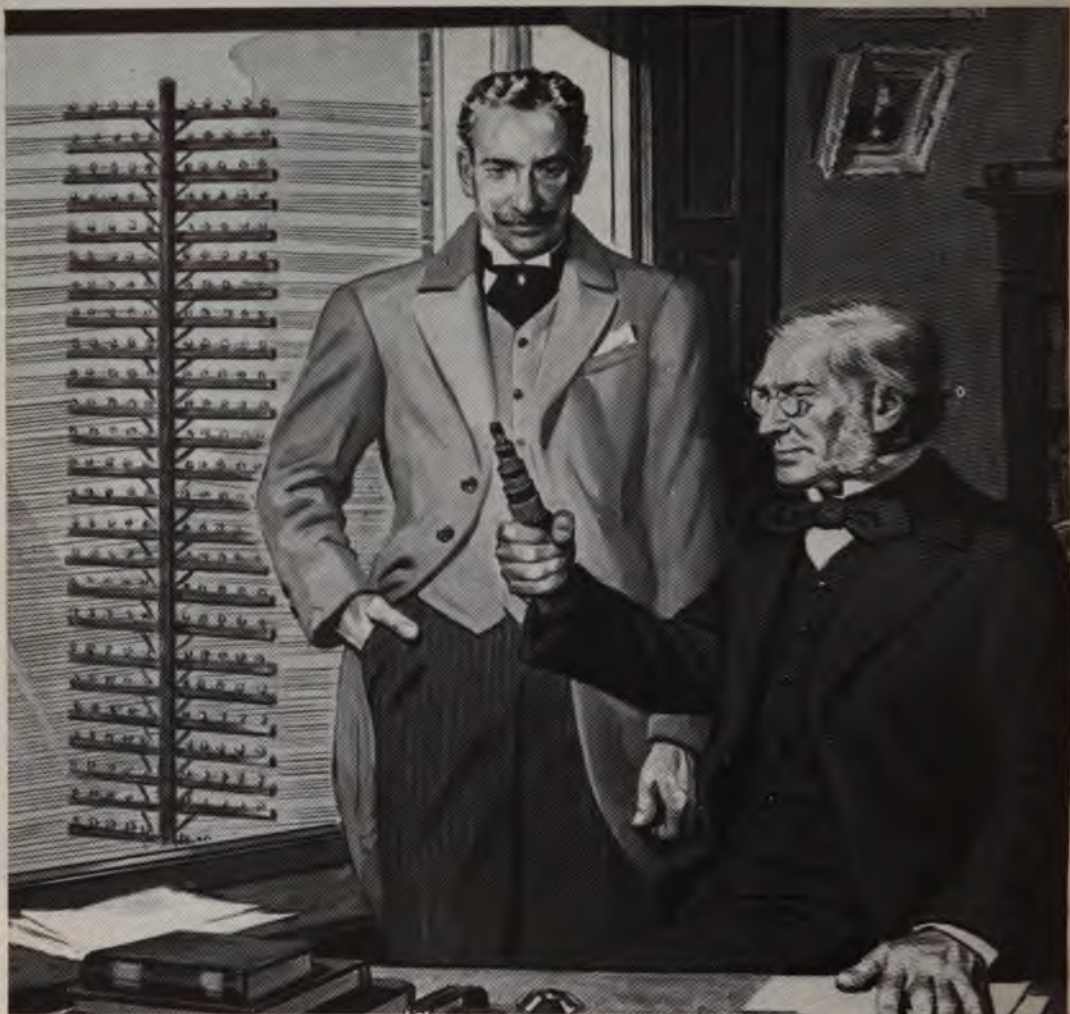
These same methods have developed acoustical systems for other high noise-level applications—the diesel-engine room of a submarine, the bridge of a battleship during main-battery firing, or AA gun positions at the height of an anti-aircraft attack.

Consideration of problems such as were presented in these high-articulation earphones and microphones are the daily concern of RCA engineers. To all such problems is brought the same experience, persistence, and ingenuity which has made RCA the leader in the fields of radio and electronics.



RADIO CORPORATION of AMERICA
ENGINEERING PRODUCTS DEPARTMENT, CAMDEN, N.J.

In Canada: RCA VICTOR Company Limited, Montreal



They Packed a Pole Line Into a Pipe

Back in the eighties, telephone executives faced a dilemma. The public demanded more telephone service. But too often, overloaded telephone poles just couldn't carry the extra wires needed, and in cities there was no room for extra poles. Could wires be packed away in cables underground?

Yes, but in those days wires in cables were only fair conductors of voice vibrations, good only for very short distances. Gradually cables were improved; soon

every city call could travel underground; by the early 1900's even cities far apart could be linked by cable.

Then Bell scientists went on to devise ways to get more service out of the wires. They evolved carrier systems which transmit 3, 12, or even 15 voices over a pair of long distance wires. A coaxial cable can carry 1800 conversations or six television pictures. This is another product of the centralized research that means still better service for you in the future.



BELL TELEPHONE LABORATORIES EXPLORING AND INVENTING, DEVISING AND PERFECTING, FOR CONTINUED IMPROVEMENTS AND ECONOMIES IN TELEPHONE SERVICE

PUBLICATIONS

U. S. NAVAL INSTITUTE, ANNAPOLIS, MARYLAND

Members of the Institute, both regular and associate, are allowed a discount of 10 per cent on books in this list unless otherwise indicated.

(Prices subject to change without notice.)

ATHLETICS

Modern Fencing.

By Clovis Deladrier, Head Fencing Master, U. S. Naval Academy. 1948. 312 pages. Illustrated. \$5.00 postpaid.

Physical Training Manual.

By the Department of Physical Training. 1942. 322 pages. Illustrated. \$2.25 postpaid.

Naval Aviation Physical Training Manuals. (1943 and 1944. Illustrated.)

Basketball. 268 pages. \$3.00 postpaid.

Boxing. 296 pages. \$3.00 postpaid.

Football. 256 pages. \$3.00 postpaid.

Gymnastics and Tumbling. 484 pages.

\$4.50 postpaid.

Hand-to-Hand Combat. 238 pages. \$3.00 postpaid.

Mass Exercise, Games, Tests. 246 pages. \$3.00 postpaid.

Military Track. 186 pages. \$3.00 postpaid.

Soccer. 192 pages. \$3.00 postpaid.

Sports Program. 220 pages. \$3.00 postpaid.

Swimming. 342 pages. \$3.75 postpaid.

Wrestling. 172 pages. \$3.00 postpaid.

BIOGRAPHY

Admiral de Grasse and American Independence.

By Professor Charles L. Lewis, U.S.N.A. 1945. 404 pages. \$3.30 postpaid.

John Paul Jones: Fighter for Freedom and Glory.

By Lincoln Lorenz. 1943. 868 pages. Illustrated regular edition \$5.50 postpaid. \$5.00 to members. Autographed limited edition \$7.00 postpaid (no discount).

David Glasgow Farragut.

By Professor Charles L. Lewis, U.S.N.A.

Vol. I, Admiral in the Making. 1941. 386 pages. Illustrated. \$4.25 postpaid. \$3.30 to members.

Vol. II, Our First Admiral. 1943. 530 pages. Illustrated. \$5.00 postpaid. \$4.00 to members.

Admiral Franklin Buchanan.

By Professor Charles L. Lewis, U.S.N.A. 1929. 285 pages. \$2.00 postpaid.

Matthew Fontaine Maury.

By Professor Charles L. Lewis, U.S.N.A. 1927. 264 pages, \$4.50 postpaid.

ENGINEERING

Alternating Current Circuits and Machinery.

By the Department of Electrical Engineering. 1945. 248 pages. \$3.30 postpaid.

Energy Analysis of Naval Machinery.

By the Department of Marine Engineering. 1940. 550 pages. Illustrated. \$4.50 postpaid.

Engineering Materials.

By the Department of Marine Engineering. 1949. 282 pages. Illustrated. Paper cover, screw-post binding. \$6.00 postpaid.

Engineering Materials and Processes.

By Lieutenant B. F. Brown, U. S. Naval Reserve. 1946. 210 pages. Illustrated. \$4.25 postpaid.

Combustion Engines Manual.

By the Department of Marine Engineering. 1949. 186 pages. Illustrated. Paper cover, screw-post binding. \$5.00 postpaid.

Internal-Combustion Engines.

By the Department of Marine Engineering. 1937. 5th edition. 212 pages. Illustrated. \$2.75 postpaid.

Naval Machinery.

By the Department of Marine Engineering. Naval Academy textbook until July, 1946. 1941. 638 pages. Illustrated. \$5.50 postpaid.

Naval Machinery.

By the Department of Marine Engineering. 1946. (2 volumes, each 8¼ x 11 inches, 2 columns to a page.)

Volume I covers "Naval Boilers" and "Naval Turbines." 336 pages and 21 large folded inserts. \$4.50 postpaid.

Volume II covers "Naval Auxiliary Machinery" and "Naval Reciprocating Engines." 420 pages and one large folded insert. \$4.75 postpaid.

Principles of the Basic Mechanisms.

By the Department of Marine Engineering. 1947. 234 pages. Illustrated \$2.50 postpaid.

HISTORY

The United States Coast Guard, 1790-1915.

By Captain Stephen H. Evans, U. S. Coast Guard. A Definitive History (With a Postscript: 1915-1949). 1949. 228 pages. Illustrated. \$5.00 postpaid. \$3.00 to members.

Round-Shot to Rockets.

By Taylor Peck. A history of the Washington Navy Yard and U. S. Naval Gun Factory. 1949. 267 pages. Illustrated. \$3.00 postpaid. \$1.80 to members.

Lion Six.

By Captain D. Harry Hammer, U. S. Naval Reserve. The story of the building of the great Naval Operating Base at Guam. 1947. 125 pages. Illustrated. \$2.50 postpaid.

Sons of Gunboats.

By Commander F. L. Sawyer, U. S. Navy (Retired). Personal narrative of gunboat experiences in the Philippines, 1899-1900. "The Ancient and Honorable Sons of Gunboats." 1946. 166 pages. Illustrated. \$2.75 postpaid.

A History of Naval Tactics from 1530 to 1930.

The Evolution of Tactical Maxims. By Rear Admiral S. S. Robison, U. S. Navy (Retired), and Mary L. Robison. 1942. 892 pages. Illustrated. \$6.50 postpaid.

The Battle of Jutland.

By Commander H. H. Frost, U. S. Navy. 592 pages: 71 sketches and 15 halftone illustrations. 1936. \$5.00 postpaid.

***Naval Warfare under Oars.* 4th to 16th centuries.**

By Vice Admiral William L. Rodgers, U. S. Navy (Retired). 1940. 372 pages. Illustrated. \$5.50 postpaid. \$4.40 to members.

The Dardanelles Expedition.

By Captain W. D. Puleston, U. S. Navy. 2d edition. 1927. 172 pages including 70 illustrations. \$3.00 postpaid. \$2.50 to members.

Some Stories of Old Ironsides.

By Commander H. H. Frost, U. S. Navy. 1931, 32 pages. Illustrated. Paper cover. \$2.25 postpaid. (No discount.)

We Build a Navy.

By Lieutenant Commander H. H. Frost, U. S. Navy. A vivid and dramatic narrative of our early Navy. 1929. 517 pages. Illustrated. \$2.75 postpaid.

Yankee Mining Squadron.

By Captain R. R. Belknap, U. S. Navy. 1920. 110 pages. Illustrated. \$1.50 postpaid.

LANGUAGES

***New Naval Phraseology.* (In six languages.)**

By the Department of Foreign Languages. 1944. 336 pages. \$2.20 postpaid.

Russian Supplement to New Naval Phraseology.

By the Department of Foreign Languages. 1946. 152 pages. \$3.50 postpaid.

***Combats et Batailles sur Mer.* (In French.)**

***Combates y Batallas en el Mar.* (In Spanish.)**

Story of *Emden* and Battles of Coronel and Falklands. By C. Farrere and P. Chack. Each about 130 pages. Paper cover. \$2.20 each postpaid.

Russian Conversation and Grammar.

By Associate Professor Claude P. Lemieux, Department of Foreign Languages. An inductive method for first-year students. 1949. 216 pages. \$3.75 postpaid.

MATHEMATICS

Analytic Mechanics.

By Associate Professor A. E. Currier, U.S.N.A. 1948. 316 pages. \$4.75 postpaid.

Refresher Course in Fundamental Mathematics for Basic Technical Training.

Prepared by Training Division, Bureau of Naval Personnel, Navy Department. 1942. 176 pages. Paper cover. \$3.00 postpaid. (No discount.)

Spherical Trigonometry.

By the Department of Mathematics. 1946. 92 pages. \$2.20 postpaid.

Plane and Spherical Trigonometry.

By H. T. Muhly and S. S. Saslaw. 1948. 220 pages. \$3.00 postpaid.

Logarithmic and Trigonometric Tables.

By the Department of Mathematics. 1945. 93 pages. \$1.65 postpaid.

MISCELLANEOUS

Sailing and Small Craft down the Ages.

By E. L. Bloomster. 1940. 290 pages. 425 silhouette drawings. Trade edition \$5.50 postpaid. \$4.40 to members. De luxe autographed edition \$12.50 postpaid. \$10 to members.

Physics of Aviation—An Elementary Text on the Theory of Flight.

Prepared by the Department of Electrical Engineering. 1944. 150 pages. Illustrated. \$1.40 postpaid.

Refresher Shorthand in Naval Terminology.

By Anne A. Stewart and Kathleen V. Sullivan. Designed for, and sale limited to, participants in training and work improvement programs of U. S. Navy and U. S. Coast Guard. 1947. 142 pages. Paper cover. \$.70 postpaid.

Naval Customs, Traditions, and Usage.

By Lieutenant Commander Leland P. Lovette, U. S. Navy. 3d edition. 1939. 424 pages. Illustrated. \$.220 postpaid.

Books of the Sea.

By Professor Charles L. Lewis, U.S.N.A. 1943. 328 pages. \$3.30 postpaid.

Naval Leadership with Some Hints to Junior Officers and Others.

A compilation for and by the Navy. 4th edition. 1939. 140 pages. \$.90 postpaid.

Naval Leadership.

Prepared at the U. S. Naval Academy under the direction of the Superintendent for the instruction of midshipmen. First edition. 1949. 324 pages. \$3.00 postpaid. \$2.25 to members.

Naval Administration, Vol. I.

By the Department of Seamanship and Navigation. 1943. 226 pages. Paper cover. \$.70 postpaid.

Personnel Administration at the Executive Level.

By N. G. Asbury. 1948. 52 pages. Illustrated. Paper cover. \$2.75 postpaid.

International Law for Naval Officers.

By Comdr. C. C. Soule, U. S. Navy, and Lieut. Comdr. C. McCauley, U. S. Navy. 245 pages. Revised 1928 by Lieut. Comdr. C. J. Bright, U. S. Navy. \$2.20 postpaid.

Naval Aviation.

By the Training Division, Bureau of Aeronautics. 1943. 158 pages. Illustrated. \$2.20 postpaid.

How to Survive on Land and Sea.

Naval Aviation Physical Training Manual. 1943. 278 pages. Illustrated. \$2.20 postpaid.

Index to Proceedings (Nos. 1 to 100) and (Nos. 101 to 200).

\$1.50 each, postpaid. (No discount.)

Naval Essays of Service Interest.

Collection of 35 selected PROCEEDINGS articles for over 26-year period. 1942. Cloth cover \$1.50. Paper cover \$1.25 postpaid. (No discount.)

U. S. Naval Academy 90th Anniversary Number—October, 1935, "Proceedings."

224 pages. Paper cover. \$.50 postpaid. Blue cloth \$1.25 postpaid. (No discount.)

U. S. Naval Academy 100th Anniversary Number—April, 1946, "Proceedings."

164 pages. Paper cover. \$.50 postpaid. (No discount.)

NAVAL CONSTRUCTION

Principles of Warship Construction and Damage Control.

By Lieut. Comdr. G. C. Manning (C. C.), U. S. Navy, and Lieut. Comdr. T. L. Schumacher (C. C.), U. S. Navy. 1935. 396 pages. Illustrated. \$2.50 postpaid.

Structural Design of Warships.

By Doctor William Hovgaard. 2d edition, revised and enlarged. 1940. 425 pages. Illustrated. \$6.60 postpaid.

NAVAL ORDNANCE

Exterior Ballistics Pamphlet.

By Department of Ordnance and Gunnery. 1948. 76 pages. Paper cover. \$.70 postpaid.

Range and Ballistic Tables.

Contains tables required for *Exterior Ballistics Pamphlet*. 1946. \$2.50 postpaid.

Naval Ordnance.

By the Department of Ordnance and Gunnery. 1937. (Reprinted 1939 with corrections.) 482 pages. Illustrated. \$6.60 postpaid.

Exterior Ballistics.

By Lieutenant Commander E. E. Herrmann, U. S. Navy. 1935. 305 pages. \$2.75 postpaid.

Range and Ballistic Tables.

Contains tables required for *Exterior Ballistics*. 1935. \$2.50 postpaid.

Naval Weapons and Their Uses.

By the Department of Ordnance and Gunnery. 1943. 80 pages. Illustrated. Paper cover. \$.45 postpaid.

NAVIGATION

Navigation and Nautical Astronomy.

Originally by Commander Benjamin Dutton, U. S. Navy. Revisions by the Department of Seamanship and Navigation. A textbook for the instruction of midshipmen and officers of the U. S. Navy. 9th edition. 1948. 876 pages. \$4.00 postpaid.

Mathematics for Navigators—A Supplement to Dutton's Navigation and Nautical Astronomy.

1940. 30 pages. Paper cover. \$.05 postpaid.

Introduction to Astronomy.

By the Department of Seamanship and Navigation. Background of astronomy necessary to study of navigation. 1941. 60 pages. Illustrated. Paper cover. \$.55 postpaid.

Practical Manual of the Compass.

By Captain Harris Laning, U. S. Navy and Lieut. Comdr. H. D. McGuire, U. S. Navy. 1921. 172 pages. Illustrated. \$3.60 postpaid.

PICTORIAL

Around the World with the Fleet, 1907-1909.

280 pages of pictures taken on that cruise. 1929. \$1.50 postpaid.

The Five Ages.

Five pictures in colors illustrating "Age of Oars," "Age of Oars and Sail," "Age of Sail," "Age of Sail and Steam," and "Age of Steam." Outside size 9" x 12". Set of five sheets, \$1.00 postpaid.

RADIO

Basic Course in Electronics.

By the Department of Electrical Engineering. 1948. 394 pages. Illustrated. \$5.00 postpaid.

Robison's Manual of Radio Telegraphy and Telephony.

By Captain S. C. Hooper, U. S. Navy. 8th revised edition. 1928. 791 pages. Illustrated. \$4.40 postpaid.

SEAMANSHIP

Rules of the Nautical Road.

By Commander R. F. Farwell, U. S. Naval Reserve. 2d edition. Corrected and reprinted 1945. 446 pages. Illustrated. \$2.50 postpaid.

Watch Officer's Guide.

By Captain Russell Willson, U. S. Navy. Corrected and reprinted 1945. 276 pages. \$1.25.

The Bluejackets' Manual, U. S. Navy.

13th edition. 1946. 622 pages. Illustrated. \$1.25 postpaid.

On a Destroyer's Bridge.

By Commander H. H. Frost, U. S. Navy, 1930. 130 pages. Illustrated. \$2.20 postpaid.

Practical Knots and Splices.

By Kenneth E. Cahoon. 1942. 78 pages. Illustrated. \$.70 postpaid.

The Rules of the Nautical Road

(2nd Edition, Reprinted with changes and corrections December, 1945)

By CAPTAIN RAYMOND F. FARWELL, U. S. Naval Reserve

(x + 436 pages) with a frontispiece and 109 illustrations in color drawn by Howard Dunn from the Walt Disney navy training film of the book.

This book has several distinctive features not found in any other publication on the subject:

The international, inland, and pilot rules have been edited, arranged in parallel columns, and divided into ten lessons, with notes, for convenient study purposes.

The intricate "law of collisions" is discussed in twelve logically developed chapters, with particular reference to the confusing differences in the rules in inland waters and on the high seas. The case method is followed and 400 ruling cases analyzed. A clear and concise summary at the end of each chapter gives the substance of the chapter in a nutshell.

Appendix A contains the full text of the International Rules, Inland Rules, Pilot Rules, Great Lakes Rules, Pilot Rules for the Great Lakes, Western Rivers Rules, Pilot Rules for Western Rivers, War Department Rules, Panama Canal Rules, and Motorboat Act of 1940.

The illustrations, each a work of art, show visually the lights required for every type of vessel on the high seas and in the inland waters of the United States.

More than 400 examination questions for practice are printed in Appendices B and C.

A book which should be in every professional mariner's library.

Price \$2.50 postpaid

RULES OF THE NAUTICAL ROAD

U. S. Naval Institute
Annapolis, Maryland

For the enclosed remittance ofplease sendcopy
(copies) of *Rules of the Nautical Road* to
.....
.....

Northern Ordnance Incorporated

Division of
Northern Pump Company

Hydraulic Machinery and Gun Mounts
MINNEAPOLIS, MINNESOTA

Johns-Manville
INSULATIONS • PACKINGS

MARINITE
BULKHEADS FOR
AUXILIARY VESSELS

 22 EAST 40TH ST. - NEW YORK 16, N.Y.

MUELLER BRASS CO.
PORT HURON, MICHIGAN

Brass, Bronze and Aluminum Forgings and Screw Machine Parts for aircraft, torpedoes, naval craft, guns and many other types of munitions.

STREAMLINE Solder fittings and Seamless Copper Pipe for Marine and Government piping systems.

Valves, Fittings and Accessories for mechanical refrigeration. "600" Bearing Metal for those tough jobs.

CURTIS BAY TOWING COMPANY
INCORPORATED 1910

CURTIS BAY TOWING COMPANY OF
PENNSYLVANIA

Member—American Waterways Operators

Bay—River and Harbor Towing


Mercantile Trust Building, BALTIMORE 2, M.D.
Telephone: Mulberry 8700

12 South 12th Street, PHILADELPHIA 7, PA.
Telephone: Lombard 3-3977

Cable—Radio "CURTISBACO."

You can depend on
premium performance
from any product
that bears the name

AMERICAN BOSCH

 America's Greatest Name
in Fuel Injection
Equipment

American Bosch Corporation
Springfield 7, Massachusetts
Service the Whole World Over

WILSON TUBE CLEANERS

 Proved in Marine service for many years. A cleaner for every type of tube or pipe on ship or ashore. Air, steam, water or electrically-driven. Available for every size tube.

**Now WILSON - DUDGEON
TUBE EXPANDERS**

For re-rolling old tubes or installing new ones. Precision manufactured, these tube expanders insure firm seating, easy rolling. All sizes, in flaring and non-flaring types, available.

THOMAS C. WILSON, INC. 21 11 44th Ave.
LONG ISLAND CITY 1, N.Y.

Mention the Naval Institute—It Identifies You

PUMP SPACE LIMITED?



Install an
IMO

- The capacity of the IMO is increased by high speed operation. This compact pump can be directly connected to the driving machine without bulky speed reduction gearing.

- IMO Pumps can be furnished for practically any capacity and pressure required for oil, hydraulic-control fluids and other liquids.



Send for
Bulletin-146U

IMO PUMP DIVISION of the
DE LAVAL STEAM TURBINE CO.
TRENTON, NEW JERSEY



The MARCUS L. URANN

251.7' x 44.3' x 24.1'

The only five-master built on the Kennebec below Bath.

The launching of the MARCUS L. URANN in 1904 ended the MINOTT shipbuilding story, begun in 1854. A newspaper of the day read, "The huge bunch of roses used by Miss Abby Minott, the sponsor, were blown among the crowd in the yard and there was a wild scramble for a rose for souvenir of the launching." It was a colorful ending in this little Maine village, to half a century of building ships to sail the sea lanes of the world.

Like the great percentage of those sturdy old sailing vessels, the URANN was Hyde equipped.

HYDE WINDLASS COMPANY, BATH, MAINE

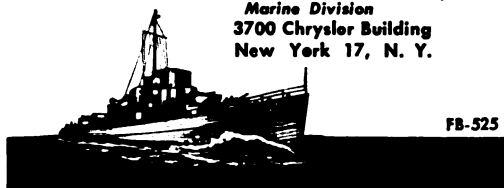
HYDE DECK MACHINERY

Ocean-Tested PROPULSION GEARING

The reliability of Farrel gears has been proved at sea in a wide variety of Naval vessels, including destroyer escorts, patrol craft, sea plane tenders, submarines, submarine tenders, mine sweepers, landing craft, tugs and miscellaneous service vessels.



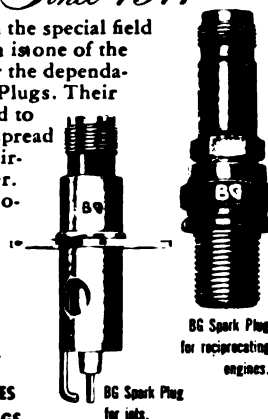
FARREL-BIRMINGHAM COMPANY, INC.
Marine Division
3700 Chrysler Building
New York 17, N. Y.



FB-525

W Symbol of
Dependable Service
Since 1917

Long experience in the special field of aviation ignition is one of the notable reasons for the dependability of BG Spark Plugs. Their high quality has led to their present widespread use in all types of aircraft the world over. Whether for reciprocating or jet engines,—you may avail yourself of our experience by discussing your particular needs with BG engineers.



FOR AIRCRAFT ENGINES
AIRCRAFT SPARK PLUGS

THE BG CORPORATION

NEW YORK 19, N. Y.

Mention the Naval Institute—It Identifies You

STRENGTH whenever America Needs Strength

As in '18 and again in the '40's, whenever the need arises, Blaw-Knox stands ready — and prepared — to throw its powerful production facilities into full support of our military forces.



**AMERICAN
FLEXIBLE BRONZE STEAM HOSE**
Diesel Engine Exhaust Hose
Flexible Seamless Tubing
Flexible Steel Oil Hose

ANACONDA
The American Brass Company

**THE AMERICAN BRASS COMPANY
AMERICAN METAL HOSE BRANCH**
General Offices: WATERBURY 88, CONN.

ORDNANCE FORGINGS

Complete control—from making the basic electric steel to final machining and inspection—assures the invariable quality of all the National forgings made to Navy specifications.



**NATIONAL FORGE &
ORDNANCE COMPANY**
IRVINE, WADSWORTH COUNTY, PENNA.
Washington Office: 1223 17th St., N. W.

A Five Star Plant

WATERBURY TOOL

Division of Vickers Incorporated

**VARIABLE SPEED HYDRAULIC
TRANSMISSIONS**

WATERBURY 91, CONNECTICUT

WARREN
STEAM PUMP COMPANY, INC.
WARREN, MASS.
PUMPS

THE TREDENNICK-BILLINGS CO.

Building Construction
10 High St., Boston, Mass.

STANDARD DREDGING CORPORATION

Galveston, Texas
320 Cotton Exchange Bldg.

MARITIME EXCHANGE BLDG.
80 BROAD STREET, NEW YORK 4, N.Y.
Telephone WHitehall 4-7660

New Orleans 12, La.
Whitney Bldg.

Los Angeles 14, Calif.
800 Central Bldg.

Harbor Improvements, Dredging, Breakwaters
Land Reclamation, Canals, Dredging Machines

Honolulu, T.H.
Aloha Tower

Mention the Naval Institute—It Identifies You

ARMSTRONG

Drop Forged EYE BOLTS



*They'll carry
the Load*

ARMSTRONG Drop Forged Eye Bolts for strength—correctly engineered proportions, in quality, uniformity of design in all sizes of best mild steel, heat treated to increase tensile strength. Built to tool standards, not hammered “tonnage” forgings, they always carry their load safely.

Available by Armstrong distributors with or without flanges, threaded or as blanks in 16 sizes (openings 1/4" to 4" i.d.)

ARMSTRONG BROS. TOOL CO.

6 West Armstrong Ave., Chicago 30, U.S.A.
New York San Francisco

FARMERS NATIONAL BANK OF ANNAPOLIS, MD.

Established 1805

GROSS ASSETS \$3,426,079.00
COMMERCIAL DEPARTMENT
SAVINGS DEPARTMENT

1% Interest on Savings Accounts

*Safe Deposit Boxes
Storage Vaults*

MANHATTAN MECHANICAL RUBBER PRODUCTS OF NAVY SPECIFICATIONS

RUBBER LINING FOR U. S.
SUBMARINE BATTERY
COMPARTMENTS

Raybestos-Manhattan, Inc.
Manhattan Rubber Division
New York New Jersey



LOOK CLOSELY at this BALLAST CONTROL

Note that it is not a casting, but a welded unit. The neat and sound welds indicate careful engineering in the modern Crane Shops, with the combined skill of the world's leading valve maker and fabricator of piping assemblies.

Specified by the Navy for services such as ballast control and fuel oil lines, this compound valve illustrates the complete facilities available at Crane for all special as well as regular piping equipment for marine applications. Your inquiry is invited.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.

Branches and Wholesalers Serving All Industrial Areas

VALVES • FITTINGS • PIPE • PLUMBING AND HEATING

Everything From . . .

CRANE

For Marine Piping Systems

Mention the Naval Institute—It Identifies You

**Little but
Mighty**



THE
**Monette*

8 x 30 Prism Scope

For the first time high magnification and wide field are combined in a fine prism scope small enough to fit the pocket. Only 5" long, 1 1/4" dia., weighs but 5 1/4 oz. Eight power magnification; field 300 ft. at 1000 yds., sharp and crisp to the very edge. No draw tubes, no offsets, instant one hand focussing. Self cased in top grain leather. Coated lenses and prisms-throughout.

Write for descriptive literature.

Deluxe Monette, in black finish, less case \$49.50

Instant Zipper suede case for above... 1.75


Custom Monette, with gold finished fittings and suede case..... 59.50

No federal tax. At the finer stores or from

KOLLMORGEN
*T.M. Reg. *Optical* CORPORATION

BROOKLYN 11, NEW YORK



• There's a CLEVELAND Reamer for every job. And every reamer that carries the  trade-mark can be counted upon to finish the maximum number of holes at minimum cost. For peak performance, always specify CLEVELAND Twist Drills, Reamers, Screw Extractors, Arbors, Mandrels, Sockets, Mills and Counterbores.

The **CLEVELAND** TWIST DRILL COMPANY
1145 EAST 42ND STREET
C.L.E.V.E.L.A.N.D. 14

NEW YORK 17, NEW YORK 7 • 2724 EAST GRAND BLVD., DETROIT 2 • 14 NORTH JEFFERSON ST., CHICAGO 4
1302 NORTH FIELD ST., BRIDGE 1 • 430 HUMBOLDT ST., SAN FRANCISCO 3 • 2401 EAST 12TH ST., LOS ANGELES 10
P.O. BOX 101, BRUNNEN, N.Y. 10011, N.Y. 10011

FARRAND OPTICAL CO., INC.

Bronx Blvd. & E. 238th St.

NEW YORK

Engineers, Designers and Manufacturers

Periscopes

Rangefinders

Gun Fire Control Apparatus

Optical Instruments

United States Navy

Bureau of Ordnance



Naval Ordnance Development Award



Save Money
ON YOUR
INSURANCE

INSURE YOUR AUTOMOBILE
HOUSEHOLD GOODS AND
PERSONAL PROPERTY

AT COST

ALL SAVINGS are Returned to Members Upon Expiration of Policy.

MEMBERSHIP RESTRICTED to Commissioned and Warrant Officers in Federal Services.



**UNITED SERVICES
AUTOMOBILE ASSOCIATION**

A Non-Profit Association Established in 1922
1400 E. GRAYSON ST. SAN ANTONIO 8, TEXAS

Mention the Naval Institute—It Identifies You

Book Department

For the benefit of our members, both regular and associate, the Institute Book Department will supply any obtainable naval, professional, or scientific book. A discount of 10% is allowed on books of other publishers (except on foreign and government publications and on books on which publishers do not give a discount). Allow reasonable time for orders to be cleared and books to be delivered directly to you by publishers. The trouble saved the purchaser through having one source of supply of all books should be considered. The cost will not be greater and generally less than when obtained direct from dealers.

Address SECRETARY-TREASURER
U. S. Naval Institute, Annapolis, Maryland

ROCKBESTOS

SHIPBOARD CABLES

FOR POWER, LIGHTING,
CONTROL, PROPULSION,
COMMUNICATIONS AND
TELEPHONE CIRCUITS.

These heat and flame resistant Shipboard Cables protect vulnerable circuits from failures caused by excessive temperatures. They also reduce the hazard of fires from overheated conductors which may endanger life and property.

Made to assure enduring, dependable service, these cables can be supplied to both Navy and A.I.E.E.-45 Specifications.

ROCKBESTOS PRODUCTS
CORPORATION

NEW HAVEN 4, CONN.

New York Cleveland Detroit Chicago
Pittsburgh St. Louis Los Angeles Oakland, Calif.



LIQUIDOMETER

Tank Gauges

for

Submarines, Surface
Vessels and Aircraft

THE LIQUIDOMETER CORP.
Long Island City, N.Y.

Mention the Naval Institute—It Identifies You

NEW CONSTRUCTION AND RECONVERSION . . .

As builders of record-making tankers, Sun is playing an important part in the constantly increasing trans-ocean shipment of oil. Sun facilities are also available for reconverting and repairing, and the building and reconditioning of every type of merchant craft.



Sun

SHIPBUILDING & DRY DOCK COMPANY

ON THE DELAWARE • CHESTER, PA.
25 BROADWAY • NEW YORK CITY

FORD INSTRUMENT COMPANY, INC.

Division of The Sperry Corporation

31-10 Thomson Ave.
Long Island City 1, N.Y.

Manufacturers of
Super-Precision
Instruments and Mechanisms
Paper Converting Machinery
and Printing Presses

...for REMOTE OPERATION OF BULKHEAD DOORS AND VALVES

Here's the Book
you've been
waiting for:

96 Pages
of Illustrated,
Diagrammatic and
Tabular Matter
regarding...

PHILADELPHIA
LIMITORQUE
VALVE CONTROLS



Please use your business
letterhead when writing
for this valuable catalog.

Hundreds upon hun-
dreds of valves on
land and sea—for every
conceivable use, are
being safely, speedily
and dependably op-
ened and closed by
"LimiTorques," day in
and day out.

PHILADELPHIA GEAR WORKS, INC.

Erie Ave. and G St. Philadelphia 34, Pa.
Manufacturers of Industrial Gears, Speed Reducers, LimiTorque Valve Controls

Mention the Naval Institute—It Identifies You

**Research and Development
in Electrics, Optics, and Electronics
Control Applications as well as Instrumentation**

★

SUPPLIERS TO THE U. S. NAVY FOR THE PAST TWENTY YEARS

★

KOLLSMAN INSTRUMENTS

DIVISION OF **SQUARE D COMPANY**
ELMHURST NEW YORK

**THE SHIPBUILDING BUSINESS IN THE
UNITED STATES OF AMERICA**

Published by
THE SOCIETY OF NAVAL ARCHITECTS AND MARINE ENGINEERS

The first complete authoritative book covering the
business phases of the shipbuilding industry

This two-volume publication is sponsored by the 56-year-old technical society of the shipbuilding industry. It presents in a non-technical but practical style authoritative material on the many business problems which must be solved economically and promptly in the building and repairing of ships.

Because of the importance of the shipbuilding industry as related to world trade this outstanding work by thirty authors fills a long-felt need. Ship designers and builders, manufacturers of ship equipment, ship operators, and all engineers having anything to do with marine matters will find this book a "must."

579 pages (8½" x 10¾") with numerous photographs, cuts, diagrams and charts. Attractive Buckram Cloth Binding—Price—\$12.50.

Other outstanding books published by this Society are "Principles of Naval Architecture" in two volumes—\$11.00

"Marine Engineering" in two volumes—\$11.00

"Historical Transactions" (a fifty-year review of the development of the shipbuilding industry in the United States)—\$3.50.

U. S. Naval Institute members may secure these publications at 10% discount from the above prices, postpaid in the United States.

Address: Secretary-Treasurer, U. S. Naval Institute, Annapolis, Maryland.

Mention the Naval Institute—It Identifies You

LONG RANGE ECONOMY ON SHIPBOARD INSTALLATIONS

LONG RANGE ECONOMY ON SHORE APPLICATIONS

(a) Single conductor rubber insulated cable

(b) Multi-conductor Navy Type power cable

(c) Varnished cambric marine cable with
basketweave armor

SHIPBOARD CABLES

(d) Okolite-Okoprene—up to 5000 volts

(e) Okolite-Okoprene—high voltage

(f) Varnished cambric braided

SHIPYARD CABLES

The lifetime cost of a cable rather than its first cost is the only true measure of cable economy today. Long-lived Okonite cables, built to stand up better and longer, can offset today's high installation costs.

Illustrated above are three of many Okonite-engineered cables for service at sea, as well as three of many cables for shore installations. From Okonite you can get cables that fully meet U. S. Navy and AIEE Specifications. For information write The Okonite Company, Passaic, N. J.

7253

OKONITE  **insulated wires and cables**

Diesel's Swell FOR SHELL

To handle their increased towing needs on Lake Maracaibo, Venezuela, the Shell Caribbean Petroleum Company has just acquired three ultra-modern tugs equipped with General Motors Model 12-278A Diesel engines. These sturdy, dependable GM Diesels are particularly well suited for the job, for they always deliver plenty of rugged, rapid-fire, flexible power. Remember, when you build or repower, always specify GM Diesel power—the better power plant that pays its way!

The "Burede," one of three new tugs built for the Shell Caribbean Petroleum Company by the Gulfport Shipbuilding & Drydock Corporation of Port Arthur, Texas. Each is powered with a GM Model 12-278A Diesel.



Leader in Diesel engineering development for 37 years

CLEVELAND DIESEL ENGINE DIVISION

CLEVELAND 11, OHIO

GENERAL MOTORS



ENGINES FROM
150 TO 2000 H.P.

Mention the Naval Institute—It Identifies You

(10)



What's in the Future?

WELL . . . speaking militarily, there's atomic energy, whether we like it or not. Along with guided missiles, push-button armies, airborne, jet-propelled, remote controlled . . . we'd rather not think about it. But from where we sit, it seems very likely that any war within the next hundred years is going to involve, at one time or another, the movement of troops to an objective over water—*amphibious operations* in other words. That's our specialty—*amphibious warfare*. During the last 173-odd years, the Marines have built up a pretty thorough working knowledge of web-footed tactics. Part of the Navy, we always seem to find ourselves going somewhere on ships with the idea of taking that "somewhere" away from somebody.

MAYBE you suspected we had something to sell—we do, but we'd like to present it logically. That's why we brought up the matter of amphibious operations—a subject with which you are probably well acquainted. Assuming, then, that your future service in the Navy will find you still interested in ship-to-shore matters, we want to put you in touch with an inexpensive, convenient means of keeping abreast of the latest amphibious thought and development.

The MARINE CORPS GAZETTE is the means we refer to. Professional magazine of the Marine Corps, the 1949 GAZETTE is the current model of a series which dates from 1916. For 33 years the GAZETTE has served as a forum for the interchange of information and ideas among marines, and, in its present stage of development, includes many articles by civilian experts as well.

JUST CLIP ON THE DOTTED LINE and send us your application. If you're qualified (that is, a member of the armed forces or a former member in good standing) you can join the Marine Corps Association for the same price and thereby get not only the GAZETTE but also a 10 per cent discount on purchases from the GAZETTE Bookshop.

ONLY \$3.00 FOR AN ASSOCIATION MEMBERSHIP AND 12 ISSUES OF THE MARINE CORPS GAZETTE

THE MARINE CORPS GAZETTE

Professional Magazine of the Marine Corps
BOX 106, MARINE CORPS SCHOOLS
QUANTICO, VA.

DEAR SIR: I enclose \$3.00, for which—

- ☐ Enter my name for a one year subscription to the GAZETTE.
☐ As I am qualified for membership, enroll me as a member of the Marine Corps Association.*

NAME AND RANK

ADDRESS

.....

.....
Signed

* Membership in the *Marine Corps Association* includes a one year subscription to the GAZETTE and a 10 per cent discount on all purchases from the GAZETTE Bookshop.

**U. S. NAVAL INSTITUTE
PROCEEDINGS**

NON-CIRCULATING

Stanford University Library
Stanford, California

In order that others may use this book,
please return it as soon as possible, but
not later than the date due.

